United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
University of Florida,
Institute of Food and
Agricultural Sciences,
Agricultural Experiment
Stations, and Soil and
Water Science
Department; and Florida
Department of Agriculture
and Consumer Services

Soil Survey of Levy County, Florida

How To Use This Soil Survey

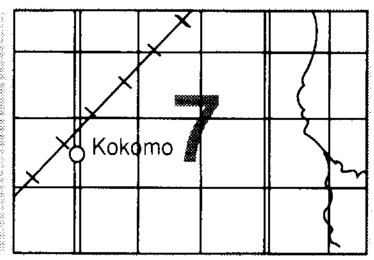
General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

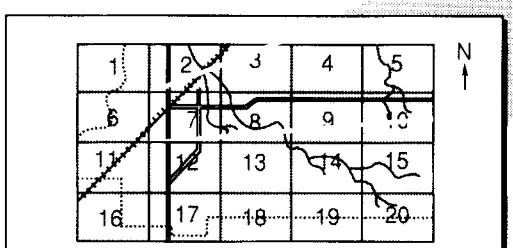
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.



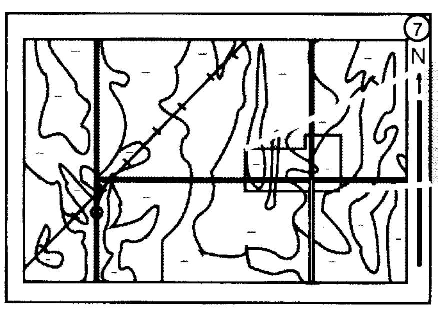
MAP SHEET

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



INDEX TO MAP SHEETS

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



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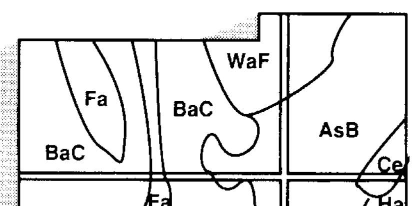

AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this survey was completed in 1989. Soil names and descriptions were approved in 1991. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1990. This soil survey was made cooperatively by the Natural Resources Conservation Service; the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations, and Soil and Water Science Department; the Florida Department of Agriculture and Consumer Services; and the Florida Department of Transportation. It is part of the technical assistance furnished by the Levy County Soil and Water Conservation District. The Levy County Board of Commissioners contributed office space for the soil scientists.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: Cattle and live oak in an area of Pedro-Jonesville-Shadeville complex, 0 to 5 percent slopes.

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Issued September 1996

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Foreword

This soil survey contains information that can be used in land-planning programs in Levy County, Florida. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

T. Niles Glasgow
State Conservationist
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Soil Survey of Levy County, Florida

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Participating in the fieldwork were Bill Anzolone, Rick Bandy, Dan Brady, Craig Ditzler, Gordon Green, Pete Hartman, Byron Koepke, Lisa Krall, Jerry McCormack, Jim Moen, Richard Neilson, Paul Pilney, Neal Svendsen, Dave Trochlell, and Steve Wangeman, Natural Resources Conservation Service, and David Tufvesson, University of Minnesota

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations, and Soil and Water Science Department; the Florida Department of Transportation; and the Florida Department of Agriculture and Consumer Services

LEVY COUNTY is in the northwestern part of the Florida Peninsula (fig. 1). It is bordered on the northwest by Dixie County, on the north by Gilchrist County, on the northeast by Alachua County, on the east by Marion County, on the south by Citrus County, and on the west by the Gulf of Mexico. The northwestern boundary of Levy County is the Suwannee River, and the southern boundary is the Withlacoochee River. Bronson is the county seat. It is in the northeastern part of Levy County.

The total area of Levy County is 749,478 acres, or approximately 1,171 square miles. Of this total, approximately 703,718 acres is land and small areas of water. Large shallow lakes and waterways make up the remaining acreage.

The main economic enterprises in the county are related to agriculture. They include the production of timber, hay, livestock, and truck and row crops.

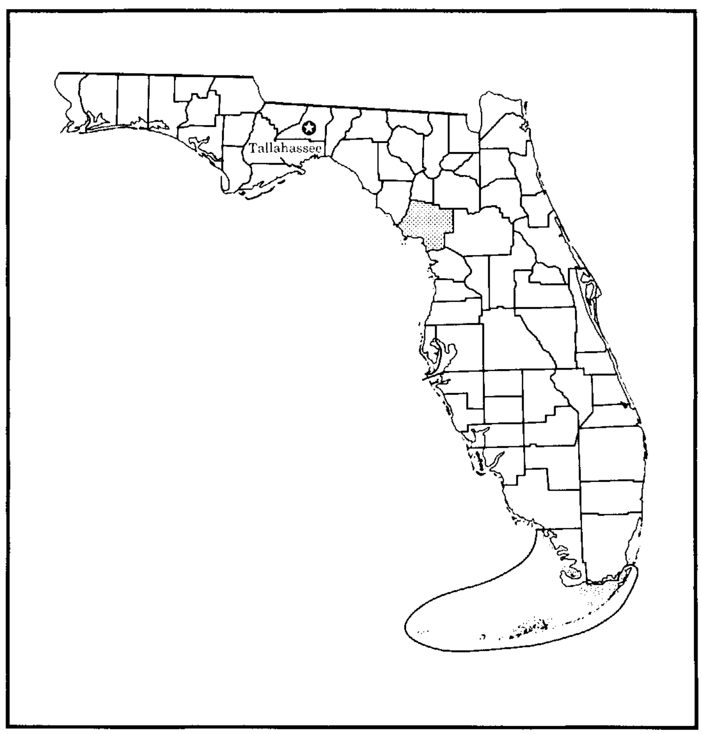

Figure 1.—Location of Levy County in Florida.

General Nature of the County

This section provides general information about environmental and cultural factors that affect the use and management of soils in Levy County. It describes

climate, history and development, physiography and geomorphology, geology and stratigraphy, water resources, mineral resources, farming, and transportation facilities.

Climate

The climate of Levy County is characterized by long, warm, humid summers. Winters are generally warm, but have occasional invasions of cool air from the north. Rainfall occurs throughout the year, and precipitation is adequate for all crops. On rare occasions hurricanes occur in the area.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Cross City in the period 1951 to 1980. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 54 degrees F and the average daily minimum temperature is 41 degrees. The lowest temperature on record, which occurred at Usher Tower on January 22, 1985, is 9 degrees. In summer, the average temperature is 80 degrees and the average daily maximum temperature is 91 degrees. The highest recorded temperature, which occurred at Usher Tower on June 4, 1985, is 103 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 57 inches. Of this, 37 inches, or 65 percent, usually falls in April through September. The growing season for most crops is included in this period. In 2 years out of 10, the rainfall in April through September is less than 30 inches. The heaviest 24-hour rainfall was 38.7 inches at Yankeetown on September 5-6, 1950, which is a record for the nation. Thunderstorms occur on about 83 days each year, and most occur in June and July.

Snowfall is rare. In 99 percent of the winters, there is no measurable snowfall. In 1 percent, the snowfall, usually of short duration, is less than 1 inch. Temperatures of 32 degrees F or less occur on an average of 29 days per year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The sun shines 65 percent of the time possible in summer and 60 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 8 miles per hour, in March and April *(26, 27)*.

History and Development

Noreen Andrews, librarian, Bronson Public Library, prepared this section.

In the early 1600's Timucuan Indians had villages throughout the area that is now Levy County. In the early 1800's when European settlers arrived in the area, the Tallohasotte Indians had settled at Clay Landing.

The Armed Occupation Act of 1842 offered land to people who would settle in the area. Many of the oldest families from the southeastern states received land at this time. The area that is now Levy County was part of Alachua County when Florida became a territory of the United States in March of 1822. Levy County was formed when Florida gained statehood in March of 1845. It was named for David Yulee Levy, a resident of Levy County who was Florida's first U.S. Senator. David Levy was responsible for bringing the first railroad to Florida. The railroad was completed in 1861. It connected Fernandina in northeastern Florida and Cedar Key in Levy County. Levyville was the original county seat, but Bronson became the county seat in 1869.

Atsenie Otie, a small island in the Gulf of Mexico off the coast of Cedar Key, had a depot and a hospital that were built by Union troops during the Civil War. The Union troops patrolled the waters of the Suwannee River and the Gulf of Mexico to prevent cotton shipments from reaching Confederate ports. The population of Atsenie Otie later grew to nearly 5,000. Most of these people were employed by the pencil factory that was established in 1880 to make use of the abundant cedar trees in the area.

Many of the small communities that were established along the early railroad line no longer exist. Present-day towns are growing. Cedar Key has commercial fishing and tourism. Gulf Hammock also provides excellent opportunities for recreational and sporting activities. It has approximately 132,000 acres, most of which is timberland. Yankeetown and Inglis are on the Withlacoochee River. The town of Crystal River has a nuclear power plant that is important to the economy of the area.

Levy County is primarily rural. Agriculture, fishing, and timber production form the economic basis for the area.

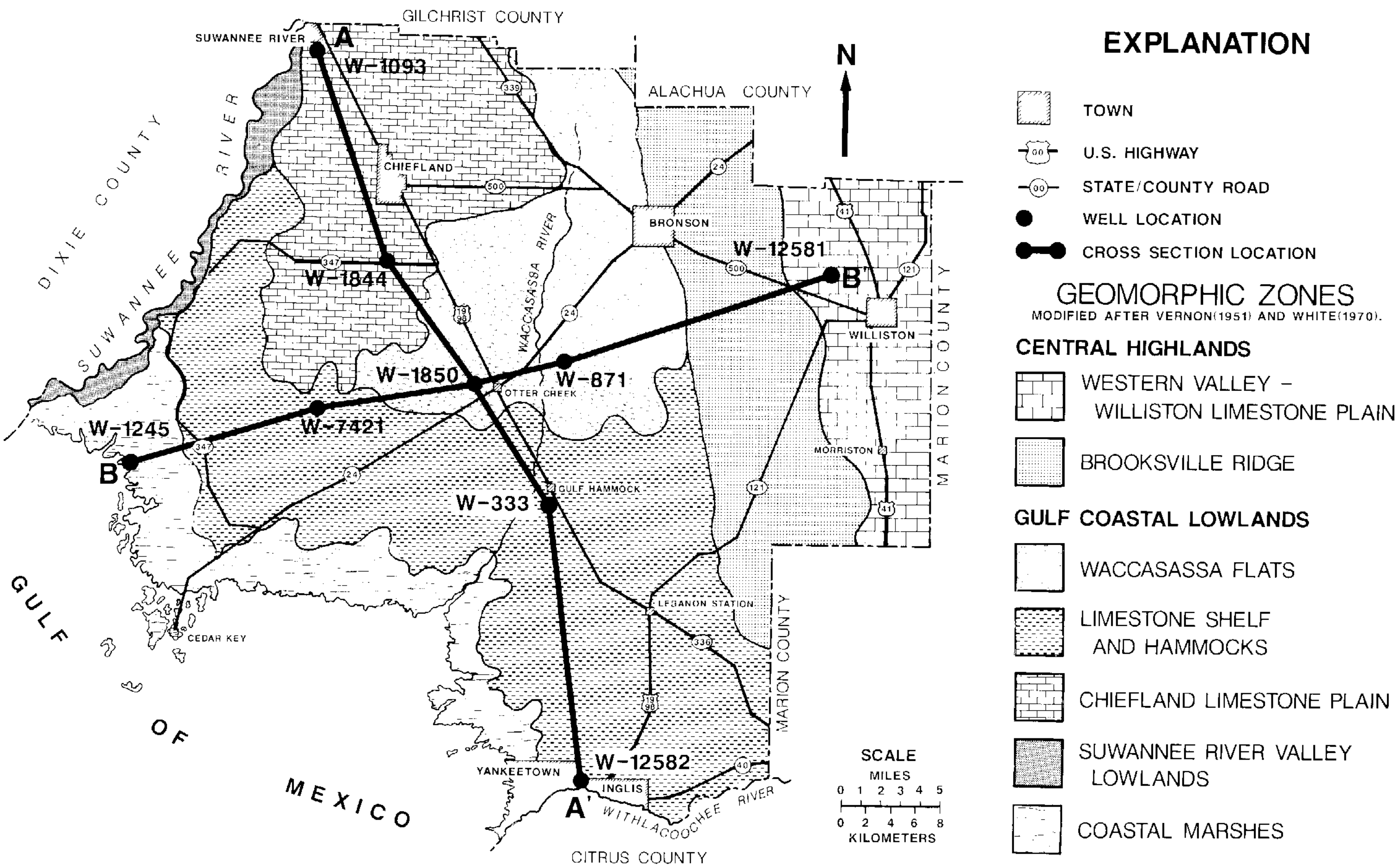

Figure 2.—Geologic cross sections in Levy County, Florida. The numbers preceded by "W" are well numbers.

Physiography and Geomorphology

Frank R. Rupert, geologist, Florida Geological Survey, prepared this section and the sections on geology and stratigraphy, water resources, and mineral resources.

Levy County is near the northern edge of the Mid-peninsular Zone *(30)*. This zone spans the Florida Peninsula from the lower edge of the topographically higher Northern Highlands southward to approximately the Caloosahatchee River. The Mid-peninsular Zone is divided into a series of geomorphic subzones that are differentiated by elevation. Two of these subzones are in Levy County. They are the Central Highlands and the Gulf Coastal Lowlands subzones *(30)*. Figure 2 shows geologic cross sections in Levy County, and figures 3 and 4 illustrate the underlying stratigraphy of these cross sections.

The Central Highlands subzone includes a series of highlands and ridges that are separated by valleys, all of which generally parallel the coastline down through the central Florida Peninsula. Two geomorphic subdivisions of the Central Highlands subzone are in Levy County. They are the Western Valley and the Brooksville Ridge geomorphic subdivisions.

The Western Valley geomorphic subdivision borders the eastern edge of Levy County *(30)*. It includes the local area of the Williston Limestone Plain *(29)*. The terrain is characteristically a gently rolling karst limestone plain overlain by a thin blanket of Pleistocene sands and containing pockets of phosphatic Alachua Formation sediments. Outcrops of the underlying Eocene limestones are common. Elevations on the Williston Limestone Plain in Levy County generally range from 60 to 90 feet above mean sea level.

The Brooksville Ridge geomorphic subdivision extends from northeastern Gilchrist County southward through eastern Levy County and terminates 110 miles to the south in Pasco County. In Levy County the ridge sediments overlie highly karstic Eocene limestone. The core of the ridge is largely comprised of Pleistocene

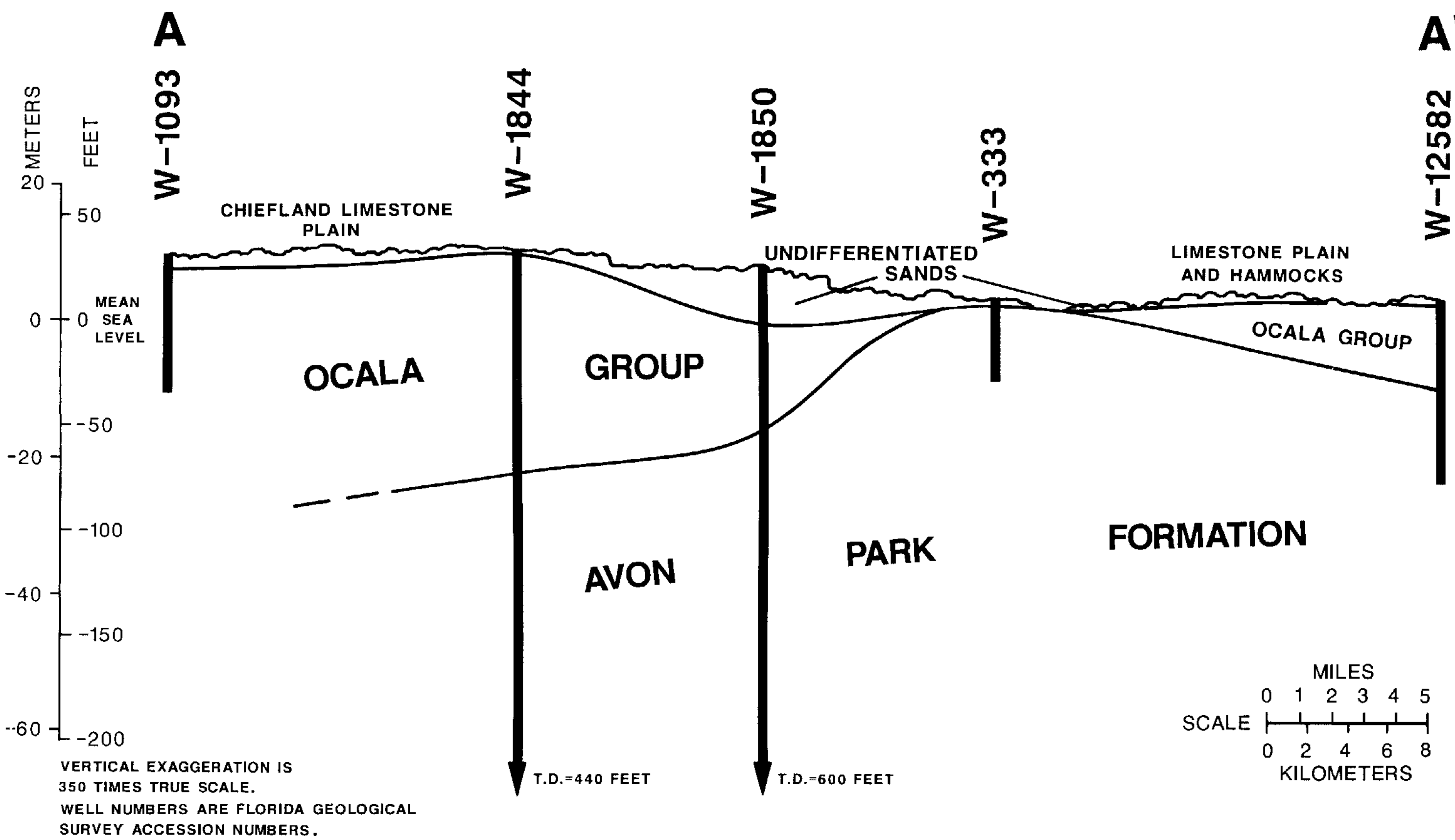

Figure 3.—Geologic cross section A-A′ in Levy County. The numbers preceded by "W" are well numbers. "T.D." means total depth.

siliciclastics and is capped by a depression-pocked rolling plain of Pleistocene marine sands. Surface elevations range from 60 feet above mean sea level at the western edge of the ridge to approximately 135 feet above mean sea level in areas of the crest.

The Gulf Coastal Lowlands subzone parallels the Gulf Coast of Florida from Fort Myers northward and then westward around the Big Bend to the Alabama State line. In the vicinity of Levy County, the Gulf Coastal Lowlands extend inland from the Gulf of Mexico distances of between 15 and 30 miles, terminating at the western edge of the Brooksville Ridge. The Gulf Coastal Lowlands in Levy County are characterized by broad, flat marine erosional plains that are underlain by Eocene limestones and blanketed by thin Pleistocene sands deposited by the regressing Gulf of Mexico. Elevations within this province range from mean sea level at the Gulf shoreline to about 60 feet above mean sea level near the Brooksville Ridge. Levy County includes several geomorphic subdivisions of the Gulf Coastal Lowlands subzone. These include the Waccasassa Flats, the Limestone Shelf and Hammocks, the Chiefland Limestone Plain, the Suwannee River Valley Lowlands, and the Coastal Marsh Belt geomorphic subdivisions *(29)*.

The Waccasassa Flats is a low, swampy area that is generally about 5 miles wide and 25 miles long. It extends from the Santa Fe River in Gilchrist County southeastward into central Levy County *(29)*. Elevations average about 55 feet above mean sea level throughout most of the flats. However, isolated sandhills that are possibly associated with Wicomico marine terrace deposits and the Brooksville Ridge reach elevations of nearly 70 feet above mean sea level. At the southern terminus of the flats, the zone broadens to about 14 miles in width and elevations decrease to 30 feet above mean sea level as the flats merge into the hammocks of southwestern Levy County. The Waccasassa River, which originates as a poorly defined channel in the swamps, lakes, and titi ponds in northern Levy County, drains the lower reaches of the Waccasassa Flats. It flows southwestward and empties into the Gulf of Mexico. The upper portion of the Waccasassa River flows in a poorly defined channel in sandy alluvium. West of U.S. Highway 19 the river is incised into a limestone channel. A narrow Holocene flood plain of

mud and sand occurs near the coast where the river merges with the coastal swamps.

The origin of the Waccasassa Flats is uncertain. The flats could be a remnant stream valley, possibly of the ancestral Suwannee River, or they could be of erosional marine origin *(29)*. The predominance of relict marine features throughout the flats supports the theory of marine origin *(14)*.

The Limestone Shelf and Hammocks geomorphic subdivision includes the Pamlico Terrace *(29)*. It is characterized by a highly karstic, erosional limestone plain overlain by sand dunes, ridges, and sand belts along ancient shorelines that parallel the coastline and are associated with the Pleistocene-age Pamlico marine terrace (approximately 10 to 25 feet above mean sea level). The irregular, highly solutioned limestone of Eocene age that underlies this area is covered by a layer of Pleistocene sands. Near the coast the limestone shelf is covered by the coastal marshes. Inland, the limestone rises gently to an elevation of about 20 feet above mean sea level. The area is heavily forested. Numerous artesian springs flow from the near-surface limestone, and during periods of heavy rainfall, much of the area floods to form a shallow swamp. Drainage from the coastal hammocks occurs through numerous small creeks and sloughs, which empty into the coastal marshes.

The Chiefland Limestone Plain is the flat, karstic limestone shelf in northwestern Levy County that is associated with the Wicomico Terrace of the Pleistocene age *(29)*. It extends from Gilchrist County southward into Levy County and terminates at the Limestone Shelf and Hammocks subdivision. It is bounded by the Waccasassa Flats on the east. The terrain is generally flat to rolling. It is characterized by a veneer of well drained Pleistocene sands, generally less than 30 feet thick, that overlie the solutioned Eocene limestones. Elevations range from 25 feet above mean

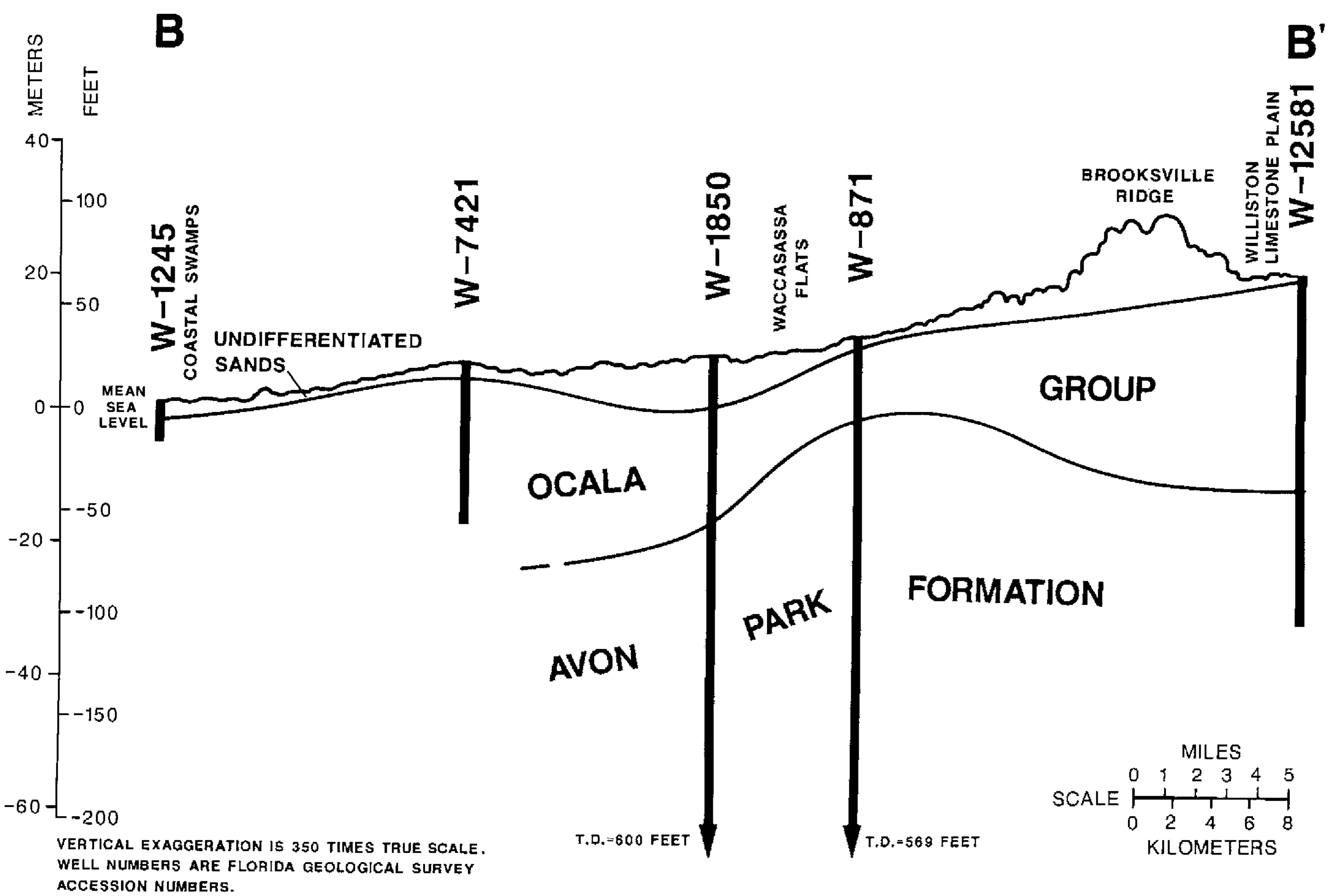

Figure 4.—Geologic cross section B-B′ in Levy County. The numbers preceded by "W" are well numbers. "T.D." means total depth.

sea level at the southern edge of the plain to nearly 50 feet above mean sea level at the Levy-Gilchrist County line.

The Suwannee River forms the northwestern boundary of Levy County and empties into the Gulf of Mexico. This river flows in a solution valley, formed in the near-surface Eocene limestones. The Suwannee River Valley Lowlands geomorphic subzone is immediately adjacent to the river. A thin veneer of Holocene alluvium and exposed limestone forms the base of this subzone *(29)*. The broadly meandering valley is less than 1 mile wide over most of its course, broadening to about 2.5 miles wide just northwest of Chiefland. Valley floor elevations average about 5 feet above mean sea level. Along its lower stretch, the river valley is covered by marshes of the Coastal Marsh Belt zone.

The Coastal Marsh Belt is situated on the drowned, seaward edge of the Eocene limestone shelf that underlies Levy County. Elevations are less than 5 feet above mean sea level. The gentle slope of the limestone plain results in a very broad, shallow continental shelf off the Florida Big Bend. Sediments are predominantly muds and alluvial sands. Partially because of an inadequate amount of sand, this area has virtually no beaches *(19)*. Marshes of juncus and spartina grasses fringe the coastline. A series of small islets or keys, comprised of limestone pinnacles or alluvial sand, are common offshore from the coast.

Geology and Stratigraphy

The oldest rock commonly penetrated by wells in Levy County is marine limestone of the Avon Park Formation of Eocene age. Undifferentiated surficial sands, clayey sands, and alluvium of Pleistocene to Holocene age are the youngest sediments. The Avon Park Formation and the younger limestone overlying it are important freshwater aquifers. The paragraphs that follow describe the sediments of Eocene age and younger.

The Avon Park Formation is a lithologically variable carbonate unit of middle Eocene age that underlies all of Levy County *(11)*. It is typically tan, buff, and brown dolomite that is commonly interbedded with white, light cream, and yellowish gray limestones and dolomitic limestones and contains varying amounts of peat, lignite, and plant remains according to Florida Geological Survey bulletins and in-house lithologic files *(29)*. Mollusks, echinoids, and foraminifera, where preserved, are the principal fossils. The top of this formation varies in depth from surface outcrop along the crest of the Ocala Platform to nearly 150 feet in northern and eastern Levy County. Surface exposures occur in two large areas. The first area is around and west of the town of Gulf Hammock, and the second extends from directly south of Lebanon Station southeastward into Citrus County. According to Florida Geological Survey in-house well files, oil test wells, which have penetrated the entire Avon Park Formation section under Levy County, reveal a total thickness for this formation of approximately 800 to 1,100 feet.

The Ocala Group consists of marine limestones that unconformably overlie the Avon Park Formation in all of Levy County except along the crest of the Ocala Platform, where the younger limestones erosionally pinch out against the Avon Park Formation *(12, 29)*. In ascending order, the Ocala Group consists of the Inglis Formation, the Williston Formation, and the Crystal River Formation. These formations are differentiated on the basis of lithology and fossil content. Typically, the lithology of the Ocala Group grades from the alternating hard and soft, white, tan, and gray, fossiliferous and dolomitic limestones of the Inglis Formation and the lower Williston Formation to the white and cream, abundantly fossiliferous, chalky limestones of the upper Williston Formation and the Crystal River Formation. Foraminifera, mollusks, bryozoans, and echinoids are the most abundant fossils in sediments of the Ocala Group.

The thickness of the Ocala Group sediments in Levy County averages about 100 feet. In the vicinity of Gulf Hammock and south of Lebanon Station, the Ocala Group thins and pinches out against the structurally high Avon Park Formation. Depth to the irregular and highly solutioned top of the Ocala Group is generally less than 50 feet. In western Levy County and offshore along the coast, a thin layer of sand covers the limestone and exposures in the form of limestone boulders and pinnacles are common. Surface exposures also are common east of the Brooksville Ridge on the Williston Limestone Plain.

Because of their permeable and cavernous nature, the Ocala Group limestones are important freshwater-bearing units of the Floridian aquifer system. Many wells in Levy County draw drinking water from the upper units of this group.

The Alachua Formation is a complex unit. It was originally defined as only the sand and clay infillings in the older karst depressions or stream channels *(6)*. The formation was later considered to be a mixture of discontinuous, interbedded clay, sand, and sandy clay, including commercially important phosphatic sand and gravel sediments *(29, 13)*. In Levy County the Alachua Formation underlies areas of the Brooksville Ridge. Scattered remnants of the formation occupy depressions in the Williston Limestone Plain and along the northeast edge of the Chiefland Limestone Plain

(29). The lithology is highly diverse. On a regional basis, the base of the formation contains minable ore and is a rubble of phosphatic rock, silicified limestone float, silicified wood, and occasional vertebrate fossils in a matrix of cream, gray, and greenish gray clays and phosphatic clays *(29)*. Quartz sandy phosphatic clay of varying thickness overlies this bed.

The phosphate rock is a minor constituent of the Alachua Formation. Mining this rock was economically feasible for many years. The rock occurs in various modes, including clay- to boulder-sized clasts and replacements of limestone and laminated phosphate (plate rock). Because the Alachua Formation was deposited on the eroded, highly karstic, and possibly faulted surface of the Ocala Group limestones, its thickness varies considerably over short distances. Most of the minable deposits are on the eastern edge of the Brooksville Ridge.

The origin and age of the Alachua Formation are uncertain. According to one theory, the formation is an in situ accumulation of weathered Hawthorn Group sediments of Miocene age *(5)*. According to another theory, the formation originated as a largely terrestrial deposit consisting of lacustrine and fluviatile components *(13)*. One suggestion is that it was deposited in an estuarine environment *(4)*. According to a more recent theory, the Alachua Formation is weathered and possibly reworked Hawthorn Group sediments but is not part of the Hawthorn Group *(16)*.

An age range of Miocene to Pleistocene, based primarily on vertebrate fossils, has been postulated for the Alachua Formation. This wide range tends to support the concept that the Alachua Formation consists of time-transgressive, reworked sediments in which younger vertebrate fauna were incorporated during each successive deposition.

Much of the core of the Brooksville Ridge in Levy County consists of reddish, clayey coarse sands. The sands are lithologically similar to those of the Citronelle Formation of the Panhandle and the Cypresshead Formation of peninsular Florida, which are both considered to be of late Pliocene to Early Pleistocene age. For the purposes of this survey, these variably colored red, orange, and pink siliciclastics, some of which contain fossil burrows, are considered undifferentiated Plio-Pleistocene sediments.

Undifferentiated Pleistocene marine quartz sands and clayey sands form a thin veneer over all of Levy County. In the western part of the county and on the Williston Limestone Plain, these sands are generally less than 20 feet thick and directly overlie the Ocala Group limestone. In east-central Levy County, they cap reddish coarse clastics and the Alachua Formation. Many of the larger and higher sand bodies in the county are relict dunes, bars, and barrier islands associated with various Pleistocene stands at sea level. The higher crests on the Brooksville Ridge, more than 100 feet above mean sea level, are associated with the Sunderland and Okefenokee Terraces *(9)*. With the exception of the Suwannee River Valley Lowlands, which is part of the Pamlico and Silver Bluff Terraces, and the Limestone Shelf and Plain, which contains Penholoway, Talbot, and Pamlico Terrace deposits, the surficial siliciclastic sediments that occur throughout the rest of Levy County are Wicomico terrace deposits *(29, 9)*.

A white to gray, fossiliferous, freshwater marl commonly occurs along the banks and in the valleys of the Withlacoochee and Suwannee Rivers. This marl generally contains an abundant freshwater mollusk fauna of Holocene age and can range to 4 feet in thickness *(29, 14)*. Quartz sand and mud alluvium of Holocene age form bars and form the base of the valleys of most major streams in Levy County.

Water Resources

Three major rivers pass through Levy County and empty into the Gulf of Mexico. These are the Suwannee River in the northwestern part of the county, the Waccasassa River in the central part, and the Withlacoochee River in the southern part. The Suwannee and Withlacoochee Rivers are navigable by motorboat throughout Levy County. The Waccasassa River is navigable for a distance of only about 5 miles upstream from its mouth. Numerous small streams and creeks transect the coastal limestone shelf and feed into these three rivers or directly into the Gulf of Mexico. Rivers and creeks are conspicuously absent in areas of the Chiefland and Williston Limestone Plains and the Brooksville Ridge. However, these areas are adequately drained by networks of underground caverns that are fed by numerous sinkholes and solution pipes that extend to the surface. Freshwater springs are another common phenomena in the area. Four large springs and numerous smaller ones are scattered throughout the county. Manatee Spring, near Chiefland, and Fanning Spring, near the town of Fanning Springs, feed into the Suwannee River. Blue Spring, near Bronson, and Wekiva Spring, near the town of Gulf Hammock, feed into the Waccasassa River. Manatee Spring, the largest of the four springs, pours out 116.9 million gallons of crystal clear water each day. Numerous shallow lakes and marshes are throughout the county.

Two main aquifer systems underlie Levy County. These are the surficial aquifer system and the underlying Floridian aquifer system. Water in these

aquifers is derived mainly from precipitation in Levy County and the adjoining counties.

The surficial aquifer system is the uppermost freshwater aquifer in Levy County. It is nonartesian and is contained within the interbedded sands and clays of the Alachua Formation and the overlying Plio-Pleistocene siliciclastics and marine terrace sands directly overlying the Ocala Group limestone. Generally, the surficial aquifer system ranges from 10 to 50 feet in thickness. The thicker portions are located under the higher geomorphic sand ridges of central and eastern Levy County. The surficial aquifer system is unconfined, and its upper surface is the water table. Generally, the elevation of the water table fluctuates with the rate of precipitation and conforms to the topography of the land surface. The surficial aquifer system is largely recharged through rainfall that percolates downward through the loose surficial siliciclastic sediments and, to a lesser extent, through upward seepage from the underlying Floridian aquifer system. The surficial aquifer system may yield quantities of water suitable for consumption, but in some areas concentrations of iron and tannic acid can impart a poor taste and color to the water.

The Floridian aquifer system is comprised of thousands of feet of Eocene marine limestone, including the Avon Park Formation and the Ocala Group. It is the principal source of drinking water in Levy County. It occurs as an unconfined, nonartesian aquifer in portions of western, northern, and eastern Levy County, where porous Pleistocene quartz sand directly overlies the limestone. In areas of east-central and eastern Levy County, where clay beds in the Alachua Formation and undifferentiated Pleistocene siliciclastics form confining units that are slowly permeable, the Floridian may function as an artesian aquifer. Depth to the top of the Floridian aquifer generally corresponds to the depth to limestone. It ranges from less than 5 feet in the coastal marshes and in the valleys of the Suwannee and Waccasassa Rivers to nearly 50 feet under the Brooksville Ridge. The potentiometric gradient is generally west-southwestward. The Floridian aquifer system in Levy County is recharged by the percolation of rainfall through the permeable surficial sands in the northwestern and eastern parts of the county. The slowly permeable siliciclastics under the Waccasassa Flats retard downward percolation and result in only low or moderate recharge in this area *(17)*. Discharge occurs in areas on the coastal limestone shelf, on coastal hammocks, and on coastal marshes because the potentiometric surface of the Floridian aquifer system is at or near land surface. Water leaves the Floridian aquifer system through natural gradient and subsequent discharge through the numerous springs and seeps in areas along the river valley lowlands and on hammocks and in the coastal marsh belt.

Mineral Resources

This section provides information on the extent of and the mining potential for mineral commodities in Levy County. The principal mineral commodities are sand, phosphate, limestone, dolomite, and clay.

A number of shallow, private pits in Levy County are mined for fill sand and aggregate. Sand deposits of Pleistocene age occur as thin veneers over the limestone plains and in thicker concentrations in the marine terrace deposits on and adjacent to the Brooksville Ridge. Since the local demand for sand products is insufficient, the potential for commercial mining is low at this time.

Phosphatic sands, clays, and limestones of the Alachua Formation deposits along the Brooksville Ridge have been mined since the early 1900's. Hard rock phosphate, a calcium fluorapatite mixture, occurs as a replacement of limestone float contained in basal Alachua Formation sediments and on top of the Ocala Group. The clays within the Alachua Formation contain colloidal phosphate and make up what is termed soft rock phosphate.

Historically, hard rock phosphate mining in Levy County has been concentrated along the Brooksville Ridge and in areas of the Williston Limestone Plain *(29)*. Presently, no active phosphate mines are in the county. Although deposits probably still exist under the Brooksville Ridge, future mining activity will depend largely on the market prices of phosphate and the economic stability of the phosphate industry.

Avon Park Formation dolomite is near the surface in the vicinity of the town of Gulf Hammock and southward almost to the Citrus County line. Two companies currently operate pits near Gulf Hammock. The extracted dolomite is used as concrete aggregate and soil conditioner and as filler in bituminous mixes *(10)*.

Ocala Group limestones are near the surface under most of Levy County. High-purity rock of road base quality is concentrated in the Chiefland and Williston Limestone Plains. Aggregate and secondary road base grades form the base of the Limestone Shelf and Hammocks and the Coastal Marshes of western Levy County. Three companies currently operate quarries in the Williston area. The Levy County Road Department extracts road base material from small, local pits. Because of the extensive deposits of limestone in the county, the potential for mining is high.

Deposits of clay and sandy clay are associated with Wicomico and Pamlico Terrace deposits in Levy County *(29)*. Most of these deposits are contained in and

interbedded with other sediments, usually on a very irregular limestone surface. Therefore, the clay deposits can vary considerably in lithology and thickness. Clays tested from two locations in Levy County showed poor strength characteristics, precluding their use in structural products *(29)*. However, by mixing the products and adding fluxes, a pottery-grade clay was produced. Reserve estimates have not been made, and the future exploitation of Levy County clay deposits will depend largely on more extensive exploration and testing, as well as market demand.

An extensive deposit of limonite, an iron-oxide mineral, occupies solution depressions in the Ocala Group limestones in an area northeast of Chiefland. A section of limonite nodules that is 20 feet in thickness is in a pit east of Chiefland. An estimated reserve of 50,000 tons is available in the area *(29)*. The most feasible use would be as ochre pigment in paint. Local residents claim that the Confederates operated a smelting furnace in the area during the Civil War and produced iron from the deposit *(29)*.

Farming

About 108,000 acres, or 15.3 percent of the total area of Levy County, is used for pasture or crops. The principal crops are watermelons, peanuts, sorghum, corn, soybeans, and small grain. Some tobacco also is grown. Cattle, hogs, and horses are the main livestock. Pensacola bahiagrass and improved bermudagrass are the most common pasture grasses used for grazing or hay.

Much of the cropland in Levy County is droughty. Sprinkler irrigation systems are commonly used to produce many crops. Wind erosion generally is a problem if cropland is unprotected. Protective measures, such as installing windstrips or field windbreaks, are generally recommended.

Historically, farming in Levy County has been dominated by pasture and row crop rotations and by the production of pine trees. Future farming trends will probably include a gradual decrease in pasture and row crop production as urban development and woodland production increase to meet demands.

The Levy County Soil and Water Conservation District was organized in 1947 to provide an organized system for assisting farmers, land users, and public agencies with problems related to soil and water conservation.

Transportation Facilities

Levy County is served by good transportation facilities. Three major Federal highways, U.S. Highway 19, U.S. Highway 27, and U.S. Highway 41, pass through the county. Numerous State and county roads serve most parts of the county. Freight rail service is available in the eastern and northern parts of the county. No passenger rail service is available. Williston Municipal Airport, near Williston, has runway facilities capable of handling large passenger and cargo planes but does not receive scheduled flights. A small public landing strip is in Cedar Key. The county also has several private landing strips that are capable of handling small- to medium-sized planes. No scheduled airline service is available in the county. Passenger bus service is available. A terminal is operated near Chiefland.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material from which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

A ground-penetrating radar (GPR) system and hand transects were used to document the type and variability of the soils occurring in map units *(7)*. The GPR system was used successfully on selected soils to measure the depth to and determine the variability of major soil horizons or other soil features. Random transects were made with the GPR and by hand in Levy County. The data collected were used to classify the soils and to determine the composition on map units. The map units, as described in the section entitled "Detailed Soil Map Units," are based on this data.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area are generally collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called soils of minor extent.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data.

The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or a building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The soils in the survey area vary widely in their potential for major land uses. Table 4 shows the extent of the map units shown on the general soil map. It shows the suitability for crops and pasture and the potential productivity for woodland in relation to that of the other map units. It lists limitation ratings for some of the major urban uses and shows soil properties that limit these uses. Ratings are given for individual soils, and an average rating is given for each association.

Each map unit is rated for *cultivated crops, pasture,* and *woodland.* Cultivated crops are those grown extensively in the survey area. Pasture refers to introduced pasture plants commonly utilized in the survey area. Woodland refers to areas managed for pine trees.

Nearly Level to Gently Rolling, Well Drained and Excessively Drained Soils on Sandy Uplands

These soils are dominantly nearly level to gently rolling, well drained to excessively drained, and sandy. They make up 99,760 acres, or about 14 percent of the county. They are in the east-central part of the county, in areas extending from Marion County in the south to Alachua County in the north.

1. Candler-Astatula-Apopka

Nearly level to gently rolling, well drained and excessively drained, sandy soils; some are loamy or have lamellae between depths of 40 and 80 inches

This map unit is on sandy uplands in the eastern part of the county. The landscape is characterized by dunelike hills and swales. The natural vegetation consists mainly of turkey oak, live oak, bluejack oak, post oak, and longleaf pine in the overstory and wiregrass, bluestems, blackberry, Spanish bayonet, Florida rosemary, and scattered saw palmetto in the understory.

This map unit makes up 91,800 acres, or about 13 percent of the acreage in the county. It is about 79 percent Candler soils, 14 percent Astatula soils, 4 percent Apopka soils, and 3 percent soils of minor extent.

Candler soils are excessively drained. Typically, the surface layer is very dark grayish brown fine sand to a depth of about 8 inches. The subsurface layer is fine sand. It is light yellowish brown to a depth of about 19 inches, brownish yellow to a depth of 37 inches, and very pale brown to a depth of 52 inches. The subsoil extends to a depth of 80 inches or more. It is very pale brown fine sand and has many thin horizontal lenses of brownish yellow loamy fine sand.

Astatula soils are excessively drained. Typically, the surface layer is dark gray fine sand to a depth of about 5 inches. The underlying material to a depth of 80 inches or more is yellow fine sand.

Apopka soils are well drained. Typically, the surface layer is grayish brown fine sand about 4 inches thick. The subsurface layer is yellowish brown fine sand to a depth of about 10 inches, light yellowish brown fine sand to a depth of 45 inches, very pale brown fine sand to a depth of 60 inches, and reddish yellow loamy fine sand to a depth of 71 inches. The subsoil extends to a depth of 80 inches or more. It is strong brown sandy clay loam.

Of minor extent in this map unit are Adamsville, Millhopper, Orlando, Placid, Popash, Sparr, and Tavares soils.

Most areas of this map unit are idle and support natural vegetation. Some areas are used for pasture, cropland, or the production of pine trees. Other areas have been subdivided for residential development.

2. Orlando

Nearly level to gently rolling, well drained, sandy soils

This map unit is on sandy uplands in the eastern part of the county. The landscape is characterized by dunelike hills and swales. The natural vegetation is dominantly live oak, laurel oak, bluejack oak, slash pine, longleaf pine, and scattered turkey oak in the overstory and blackberry, pineland threeawn, Spanish bayonet, brackenfern, bluestems, and scattered saw palmetto in the understory.

This map unit makes up 7,960 acres, or about 1 percent of the acreage in the county. It is about 91 percent Orlando soils and 9 percent soils of minor extent.

Typically, the surface layer of the Orlando soils is very dark gray fine sand about 11 inches thick. The underlying material is fine sand. It is dark brown to a depth of about 28 inches, dark yellowish brown to a depth of 34 inches, strong brown to a depth of 72 inches, and light yellowish brown to a depth of 80 inches or more.

Of minor extent in this map unit are Adamsville, Apopka, Candler, Bonneau, Millhopper, Placid, Popash, Sparr, and Tavares soils.

Most areas of this map unit are used for pasture or cropland. Other areas have been subdivided for residential development or are used for the production of pine trees.

Nearly Level to Gently Sloping, Poorly Drained to Excessively Drained Soils on Sandy and Loamy Uplands

These soils are dominantly poorly drained to well drained. They have a clayey or loamy subsoil or have bedrock at a depth of 4 to more than 80 inches. They make up 151,085 acres, or about 14 percent of the county. They are mostly in the northern, northwestern, and eastern parts of the county.

3. Otela-Candler-Tavares

Nearly level to gently sloping, moderately well drained and excessively drained, sandy soils; some are loamy or have lamellae between depths of 40 and 80 inches

This map unit is on karst uplands in the eastern and northern parts of the county and on two small ridges in the southern part. The landscape is characterized by low hills and swales and some sinkholes. The natural vegetation consists mainly of live oak, bluejack oak, laurel oak, magnolia, loblolly pine, slash pine, and longleaf pine in the overstory and blackberry, pineland threeawn, greenbrier, American beautyberry, brackenfern, bluestems, and scattered saw palmetto and cabbage-palm in the understory.

This map unit makes up 98,350 acres, or about 13 percent of the acreage in the county. It is about 47 percent Otela soils, 16 percent Candler soils, 13 percent Tavares soils, and 24 percent soils of minor extent.

Typically, the surface layer of the Otela soils is dark grayish brown fine sand about 8 inches thick. The subsurface layer is fine sand. It is brown to a depth of about 21 inches, very pale brown to a depth of 32 inches, and white to a depth of 50 inches. The subsoil is brownish yellow fine sandy loam to a depth of about 61 inches, brownish yellow sandy clay loam to a depth of 68 inches, and light gray sandy clay loam to a depth of 80 inches or more.

Typically, the surface layer of the Candler soils is grayish brown fine sand about 7 inches thick. The subsurface layer is fine sand. It is grayish brown to a depth of about 14 inches, pale brown to a depth of 30 inches, and very pale brown to a depth of 75 inches. The subsoil is white fine sand and has common thin horizontal lenses of yellowish brown loamy fine sand. It extends to a depth of 80 inches or more.

Typically, the surface layer of the Tavares soils is dark grayish brown fine sand about 9 inches thick. The underlying material is fine sand. It is grayish brown to a depth of about 18 inches, pale brown to a depth of 38 inches, very pale brown to a depth of 48 inches, and white to a depth of 80 inches or more.

Of minor extent in this map unit are Bonneau, Hicoria, Jonesville, Lochloosa, Lutterloh, Millhopper, Moriah, Pedro, Placid, Popash, Shadeville, Seaboard, and Sparr soils.

Most areas of this map unit are used for pasture or cropland. Other areas are used for the production of pine trees or have been subdivided for residential development.

4. Jonesville-Pedro-Shadeville

Nearly level to gently sloping, moderately well drained and well drained, sandy soils that are very shallow to very deep over bedrock; some are loamy within a depth of 20 to 40 inches

This map unit is on karst uplands in the eastern part of the county. The landscape is characterized by low hills and swales and some sinkholes. The natural vegetation consists mainly of laurel oak, live oak, slash pine, longleaf pine, loblolly pine, magnolia, sweetgum,

hickory, and eastern redcedar in the overstory and cabbage-palm, blackberry, American beautyberry, greenbrier, Florida holly, bluestems, pineland threeawn, and panicums in the understory.

This map unit makes up 27,840 acres, or about 4 percent of the acreage in the county. It is about 29 percent Jonesville soils, 26 percent Pedro soils, 26 percent Shadeville soils, and 19 percent soils of minor extent.

Jonesville soils are well drained and are moderately deep over limestone. Typically, the surface layer is dark gray fine sand about 9 inches thick. The subsurface layer, to a depth of about 31 inches, is a mixture of very pale brown and light gray fine sand. The subsoil, to a depth of 35 inches, is dark yellowish brown fine sandy loam. Limestone bedrock is at a depth of about 35 inches.

Pedro soils are well drained and are shallow or very shallow over limestone. Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The subsurface layer, to a depth of about 11 inches, is brownish yellow fine sand. The subsoil, to a depth of about 15 inches, is dark yellowish brown fine sandy loam. Soft limestone is at a depth of about 15 inches. The limestone bedrock becomes more consolidated at a depth of about 21 inches.

Shadeville soils are moderately well drained and are deep or very deep over limestone. Typically, the surface layer is dark grayish brown fine sand to a depth of about 10 inches. The subsurface layer, to a depth of about 23 inches, is a mixture of pale brown and yellowish brown fine sand. The subsoil, to a depth of about 45 inches, is yellowish brown sandy clay loam. Limestone bedrock is at a depth of about 45 inches.

Of minor extent in this map unit are Adamsville, Bushnell, Hicoria, Lutterloh, Mabel, Moriah, Otela, Seaboard, and Tavares soils.

Most areas of this map unit are used for pasture or cropland. Other areas are used for the production of pine trees or have been subdivided for residential development.

5. Otela-Jonesville-Seaboard

Nearly level to gently sloping, moderately well drained and well drained, sandy soils that are very shallow to very deep over bedrock; some are loamy between depths of 20 and 40 inches or 40 and 80 inches

This map unit is on karst uplands in the eastern and northern parts of the county. The landscape is characterized by low ridges and swales and some sinkholes. The natural vegetation consists mainly of live oak, laurel oak, magnolia, loblolly pine, longleaf pine, slash pine, and eastern redcedar in the overstory and blackberry, pineland threeawn, greenbrier, American beautyberry, brackenfern, bluestems, and scattered saw palmetto and cabbage-palm in the understory.

This map unit makes up 20,480 acres, or about 3 percent of the acreage in the county. It is about 35 percent Otela soils, 26 percent Jonesville soils, 26 percent Seaboard soils, and 13 percent soils of minor extent.

Otela soils are moderately well drained and are very deep over limestone. Typically, the surface layer is grayish brown fine sand about 4 inches thick. The subsurface layer is fine sand. It is light gray to a depth of about 22 inches, brownish yellow to a depth of 40 inches, very pale brown to a depth of 50 inches, and brownish yellow to a depth of 58 inches. The subsoil is dark yellowish brown sandy clay loam to a depth of 66 inches. Limestone bedrock is at a depth of about 66 inches.

Jonesville soils are well drained and are moderately deep over limestone. Typically, the surface layer is gray fine sand about 5 inches thick. The subsurface layer is fine sand. It is pale brown to a depth of about 14 inches and very pale brown to a depth of 27 inches. The subsoil is brownish yellow sandy clay loam to a depth of about 35 inches. Limestone bedrock is at a depth of about 35 inches.

Seaboard soils are moderately well drained and are shallow or very shallow over limestone. Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The underlying material is pale brown fine sand to a depth of about 17 inches. Limestone bedrock is at a depth of about 17 inches.

Of minor extent in this map unit are Bushnell, Candler, Lutterloh, Moriah, Pompano, Shadeville, and Tavares soils.

Most areas of this map unit are used for pasture or cropland. Other areas are used for the production of pine trees or have been subdivided for residential development.

6. Millhopper-Bonneau

Nearly level to gently sloping, moderately well drained, sandy soils that are very deep; some are loamy at a depth of 40 to 80 inches or 20 to 40 inches

This map unit is on uplands in the northern part of the county. The landscape is characterized by low ridges and swales. The natural vegetation consists mainly of laurel oak, live oak, slash pine, longleaf pine, loblolly pine, and scattered turkey oak in the overstory and blackberry, pineland threeawn, greenbrier, brackenfern, bluestems, and scattered saw palmetto and cabbage-palm in the understory.

This map unit makes up 1,885 acres, or less than 1

percent of the acreage in the county. It is about 53 percent Millhopper soils, 44 percent Bonneau soils, and 3 percent soils of minor extent.

Millhopper soils are moderately well drained. Typically, the surface layer is dark grayish brown fine sand about 9 inches thick. The subsurface layer is fine sand. It is pale brown to a depth of about 30 inches, very pale brown to a depth of 42 inches, and light gray to a depth of 74 inches. The subsoil is pale brown fine sandy loam. It extends to a depth of 80 inches or more.

Bonneau soils are moderately well drained. Typically, the surface layer is dark gray fine sand about 7 inches thick. The subsurface layer is pale brown fine sand to a depth of about 29 inches. The subsoil is light yellowish brown sandy clay loam to a depth of about 37 inches and light yellowish brown fine sandy loam to a depth of 60 inches. The underlying material to a depth of 80 inches or more is light gray fine sandy loam.

Of minor extent in this map unit are Adamsville, Astatula, Candler, Levyville, Lochloosa, Orlando, Sparr, and Tavares soils.

Most areas of this map unit are used for pasture or cropland. Other areas are used for the production of pine trees or have been subdivided for residential development.

7. Sparr-Ft. Green-Bivans

Nearly level to gently sloping, somewhat poorly drained and poorly drained, sandy soils; some are loamy at a depth of 40 to 80 inches or 20 to 40 inches and others are clayey within a depth of 20 inches

This map unit is on karst uplands in the northeastern part of the county. The landscape is characterized by low ridges and swales and some sinkholes. The natural vegetation consists mainly of laurel oak, live oak, slash pine, loblolly pine, magnolia, sweetgum, hickory, and eastern redcedar in the overstory and blackberry, American beautyberry, greenbrier, holly, bluestems, panicums, saw palmetto, and scattered cabbage-palm in the understory.

This map unit makes up 2,530 acres, or less than 1 percent of the acreage in the county. It is about 25 percent Sparr soils, 20 percent Ft. Green soils, 13 percent Bivans soils, and 42 percent soils of minor extent.

Sparr soils are somewhat poorly drained. Typically, the surface layer is dark gray fine sand about 8 inches thick. The subsurface layer is fine sand. It is light gray to a depth of about 45 inches and pale brown to a depth of 50 inches. The subsoil to a depth of 80 inches or more is light gray fine sandy loam.

Ft. Green soils are poorly drained. Typically, the surface layer is dark grayish brown fine sand about 7 inches thick. The subsurface layer is grayish brown fine sand to a depth of 28 inches and brown loamy fine sand that has many pockets of very dark grayish brown fine sandy loam to a depth of 33 inches. The subsoil is light brownish gray fine sandy loam to a depth of about 46 inches, dark gray sandy clay loam to a depth of 60 inches, a mixture of light greenish gray and gray sandy clay loam to a depth of 67 inches, and a mixture of light gray and gray sandy clay loam to a depth of 80 inches or more.

Bivans soils are somewhat poorly drained. Typically, the surface layer is very dark grayish brown fine sand about 5 inches thick. The subsurface layer is light brownish gray fine sand to a depth of about 17 inches. The subsoil is dark gray sandy clay to a depth of about 39 inches, gray sandy clay to a depth of 50 inches, and gray sandy clay loam to a depth of 70 inches. The underlying material is gray sandy clay to a depth of 80 inches or more.

Of minor extent in this map unit are Bushnell, Hicoria, Holopaw, Bonneau, Lochloosa, Lutterloh, Mabel, Millhopper, Moriah, and Pomona soils.

Most areas of this map are used for pasture. Other areas are used for the production of pine trees or support natural vegetation.

Nearly Level to Gently Rolling, Very Poorly Drained to Moderately Well Drained Soils on Flatwoods and Sandy Uplands

These soils are dominantly nearly level to gently rolling, very poorly drained to moderately well drained, and sandy. Some have an organic surface layer, some have a loamy subsoil, and some have a dark, organically stained, sandy subsoil. The map units make up 269,108 acres, or about 39 percent of the county. They are on most of the flatwoods, which extend from Lake Rousseau in the south to Gilchrist County in the north and from County Road 337 in the east to Cedar Key and the Suwannee River in the west.

8. Smyrna-Placid-Samsula

Nearly level, poorly drained and very poorly drained, sandy and mucky soils; some are sandy throughout, some are sandy and have a thin layer of muck at the surface, and some have muck that is 16 to 51 inches deep over sand

This map unit is mainly on flatwoods in the central and western parts of the county. The landscape is characterized by broad, low flats that are interspersed with shallow depressions. In most areas the natural vegetation consists mainly of slash pine, longleaf pine, and loblolly pine in the overstory and saw palmetto, pineland threeawn, waxmyrtle, fetterbush, gallberry, and

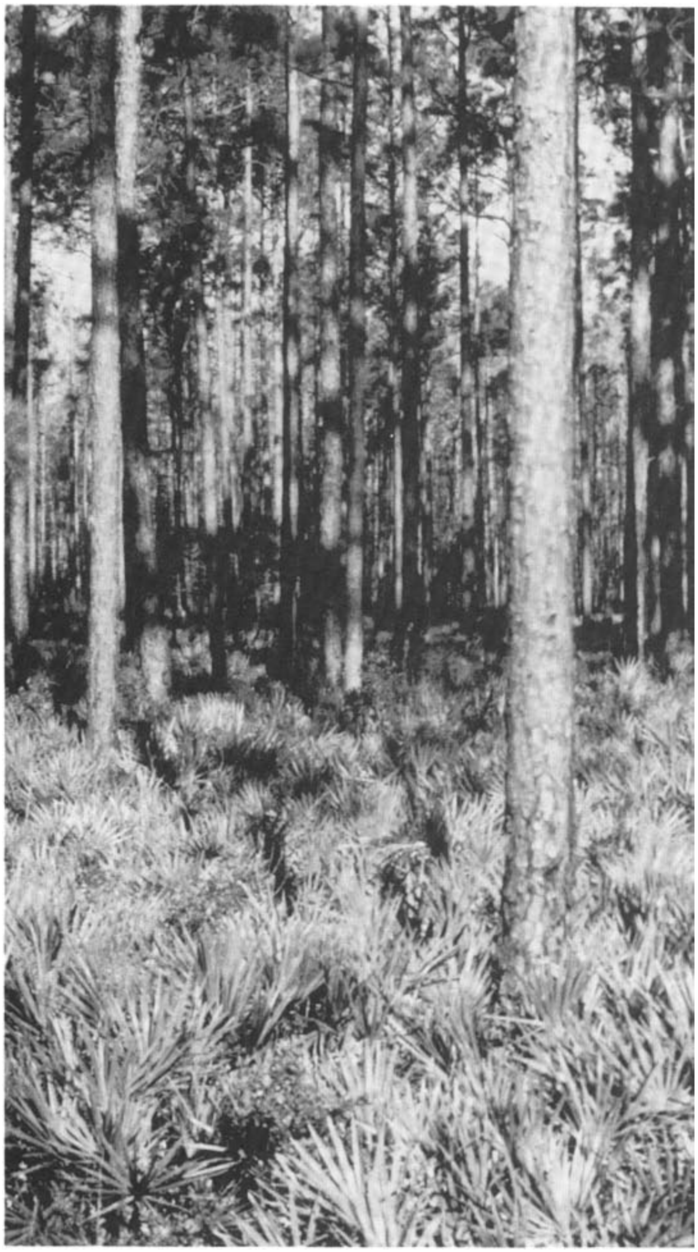

Figure 5.—Typical understory vegetation on flatwoods in an area of Smyrna fine sand.

bluestems in the understory (fig. 5). In depressions the natural vegetation consists mainly of cypress, red maple, sweetbay, sweetgum, and Florida willow in the overstory and pickerelweed, lizard tail, water iris, and scattered cabbage-palm in the understory.

This map unit makes up 195,878 acres, or about 28 percent of the acreage in the county. It is about 44 percent Smyrna soils, 18 percent Placid soils, 14 percent Samsula soils, and 24 percent soils of minor extent.

Smyrna soils are poorly drained and generally are on broad, low flats. Typically, the surface layer is dark brown fine sand about 5 inches thick. The subsurface layer is fine sand. It is gray to a depth of about 9 inches and light brownish gray to a depth of 19 inches. The subsoil is black, organically coated fine sand to a depth of about 23 inches and a mixture of dark yellowish brown and very dark grayish brown fine sand to a depth of 28 inches. The underlying material is fine sand. It is very pale brown to a depth of about 57 inches and white to a depth of 80 inches or more.

Placid soils are very poorly drained and generally are in depressions. Typically, the surface layer is black muck to a depth of about 3 inches and very dark gray fine sand to a depth of 14 inches. The underlying material is fine sand. It is light gray to a depth of about 24 inches, brown to a depth of 45 inches, and very pale brown to a depth of 80 inches or more.

Samsula soils are very poorly drained and are in depressions. Typically, the surface layer is muck. It is dark brown to a depth of 6 inches and black to a depth of 47 inches. The underlying material is fine sand. It is grayish brown to a depth of 62 inches and light brownish gray to a depth of 80 inches or more.

Of minor extent in this map unit are Adamsville, Bradenton, Holopaw, Myakka, Pineda, Pomona, Pompano, Sparr, Tavares, Terra Ceia, Wauchula, and Zolfo soils.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture or support natural vegetation and are used only as wildlife habitat.

9. Holopaw-EauGallie-Popash

Nearly level, poorly drained and very poorly drained, sandy soils that are deep or very deep over bedrock and are loamy at a depth of 40 to 80 inches

This map unit is mainly on flatwoods in the western part of the county. The landscape is characterized by broad, low flats that are interspersed with shallow depressions and drainageways. In most areas the natural vegetation consists mainly of slash pine in the overstory and saw palmetto, cabbage-palm, pineland threeawn, bluestems, waxmyrtle, fetterbush, and gallberry in the understory. In depressions the natural vegetation consists mainly of cypress, red maple, sweetbay, sweetgum, and Florida willow in the overstory and pickerelweed, lizard tail, water iris, and scattered cabbage-palm in the understory.

This map unit makes up 55,210 acres, or about 8

percent of the acreage in the county. It is about 22 percent Holopaw soils, 18 percent EauGallie soils, 11 percent Popash soils, and 49 percent soils of minor extent.

Holopaw soils are poorly drained and are on broad, low flats. Typically, the surface layer is very dark gray fine sand about 6 inches thick. The subsurface layer is fine sand. It is gray to a depth of about 9 inches, grayish brown to a depth of 19 inches, and pale brown to a depth of 42 inches. The subsoil, to a depth of about 52 inches, is olive gray sandy clay loam. Soft limestone bedrock is at a depth of about 52 inches.

EauGallie soils are poorly drained and are on broad, low flats. Typically, the surface layer is very dark gray fine sand about 6 inches thick. The upper subsurface layer, to a depth of about 16 inches, is gray fine sand. The upper subsoil is black, organically coated fine sand to a depth of about 19 inches, brown fine sand to a depth of 25 inches, and yellowish brown fine sand to a depth of 35 inches. The lower subsurface layer, to a depth of about 55 inches, is very pale brown fine sand. The lower subsoil, to a depth of about 61 inches, is gray fine sandy loam. Limestone bedrock is at a depth of about 61 inches.

Popash soils are very poorly drained and generally are in depressions. Typically, the surface layer is very dark gray fine sand about 12 inches thick. The subsurface layer is a mixture of dark grayish brown and grayish brown fine sand to a depth of about 20 inches, grayish brown fine sand to a depth of 30 inches, and light brownish gray fine sand to a depth of 45 inches. The subsoil to a depth of 80 inches or more is dark gray sandy clay loam.

Of minor extent in this map unit are Boca, Hallandale, Hicoria, Immokalee, Janney, Myakka, Placid, and Pineda soils.

Most areas of this map unit are used for the production of pine trees. Some areas are used for pasture. Other areas support natural vegetation and are used only as wildlife habitat.

10. Orsino-Myakka-Placid

Nearly level to gently rolling, very poorly drained to moderately well drained, sandy soils

This map unit is mostly in areas of flatwoods and sandy uplands in the western part of the county. The landscape is characterized by dunelike ridges and swales that are interspersed with depressions. In most areas the natural vegetation is dominantly a mixture of sand live oak and slash pine in the overstory and saw palmetto, wiregrass, waxmyrtle, gallberry, Spanish bayonet, and bluestems in the understory. In depressions the natural vegetation generally consists of thick stands of sawgrass or maidencane.

This map unit makes up 12,380 acres, or about 2 percent of the acreage in the county. It is about 22 percent Orsino soils, 19 percent Myakka soils, 12 percent Placid soils, and 47 percent soils of minor extent.

Orsino soils are moderately well drained and are on the nearly level to gently rolling dunelike ridges. Typically, the surface layer is gray fine sand about 4 inches thick. The subsurface layer is fine sand. It is very pale brown to a depth of about 8 inches and white to a depth of 13 inches. The subsoil is brownish yellow fine sand to a depth of about 48 inches, light yellowish brown fine sand to a depth of 58 inches, and brownish yellow fine sand to a depth of 70 inches. The underlying material is white fine sand.

Myakka soils are poorly drained and are in the nearly level swales. Typically, the surface layer is very dark gray sand about 5 inches thick. The subsurface layer is grayish brown sand to a depth of about 18 inches and light gray sand to a depth of 26 inches. The subsoil is organically coated sand. It is black to a depth of about 40 inches and very dark gray to a depth of 58 inches. The underlying material is pale brown sand. It extends to a depth of more than 80 inches.

Placid soils are very poorly drained and are in the nearly level depressions. Typically, the surface layer is black fine sand about 22 inches thick. The underlying material is dark gray fine sand to a depth of about 38 inches and light brownish gray fine sand to a depth of more than 80 inches.

Of minor extent in this map unit are Adamsville, Boca, Cassia, EauGallie, Gator, Holopaw, Immokalee, Paola, Pomello, Pompano, Popash, Samsula, Smyrna, Terra Ceia, Tidewater, and Zolfo soils.

Most areas of this map unit are used for the production of pine trees or support natural vegetation and are used only as wildlife habitat.

11. Cassia-Pomello-Orsino

Nearly level to gently rolling, somewhat poorly drained and moderately well drained, sandy soils

This map unit is on sandy uplands and flatwoods in the western part of the county and on small islands in the Cedar Key area. The landscape is characterized by dunelike and low ridges and low knolls. The natural vegetation consists mainly of live oak, longleaf pine, and slash pine in the overstory and saw palmetto, pineland threeawn, bluestems, and reindeer moss in the understory.

This map unit makes up 5,640 acres, or less than 1

percent of the acreage in the county. It is about 35 percent Cassia soils, 35 percent Pomello soils, 15 percent Orsino soils, and 15 percent soils of minor extent.

Cassia soils are somewhat poorly drained and are on nearly level, low knolls and ridges. Typically, the surface layer is gray fine sand about 6 inches thick. The subsurface layer, to a depth of about 24 inches, is light gray fine sand. The subsoil is very dark brown, organically coated fine sand to a depth of about 30 inches; dark brown fine sand to a depth of 55 inches; brown fine sand to a depth of 70 inches; and very dark grayish brown, organically coated fine sand to a depth of 80 inches or more.

Pomello soils are somewhat poorly drained and are on nearly level, low knolls and ridges. Typically, the surface layer is gray fine sand about 4 inches thick. The subsurface layer is light gray fine sand to a depth of about 35 inches and gray fine sand that has many very dark grayish brown and dark grayish brown, organically coated pockets to a depth of 40 inches. The subsoil is very dark brown, organically coated fine sand to a depth of about 46 inches and dark brown fine sand to a depth of 80 inches or more.

Orsino soils are moderately well drained and generally are on the nearly level to gently rolling dunelike ridges. Typically, the surface layer is gray fine sand about 4 inches thick. The subsurface layer, to a depth of about 13 inches, is white fine sand. The subsoil is fine sand. It is brownish yellow to a depth of about 48 inches, light yellowish brown to a depth of 58 inches, and brownish yellow to a depth of 80 inches or more.

Of minor extent in this map unit are Adamsville, Immokalee, Myakka, Paola, Placid, Pompano, and Samsula soils.

Most areas of this map unit are used for the production of pine trees. Some areas have been subdivided for residential development. Other areas support natural vegetation and are used only as wildlife habitat.

Nearly Level, Very Poorly Drained to Somewhat Poorly Drained Soils on the Coastal Limestone Shelf

These soils are dominantly nearly level, very poorly drained to somewhat poorly drained, and sandy and loamy. They have bedrock at a depth of 4 to more than 80 inches. They make up 112,845 acres, or about 16 percent of the county. They are on most parts of the coastal limestone shelf that is in an area bordered by the tidal marsh on the south and west, by U.S. Highway 19 on the east, and by State Road 24 on the north. They also are in a smaller area that is directly east of County Road 347, between Fowler Bluff and Sumner.

12. Wekiva-Demory-Waccasassa

Nearly level, poorly drained, sandy and loamy soils that are very shallow to moderately deep over bedrock

This map unit is on low ridges of the coastal limestone shelf in the western part of the county. The landscape is characterized by broad, low ridges that are transected by numerous small creeks and drainageways. The natural vegetation consists mainly of laurel oak, water oak, sweetgum, blackgum, red maple, basswood, eastern redcedar, loblolly pine, and slash pine in the overstory and cabbage-palm, longleaf uniola, cutgrass, panicums, bluestems, greenbrier, yaupon, poison ivy, false indigo, and desmodium in the understory.

This map unit makes up 104,020 acres, or about 15 percent of the acreage in the county. It is about 41 percent Wekiva soils, 31 percent Demory soils, 20 percent Waccasassa soils, and 8 percent soils of minor extent.

Wekiva soils are shallow to moderately deep over bedrock and are not flooded. Typically, the surface layer is very dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of about 9 inches, is grayish brown fine sand. The subsoil, to a depth of about 18 inches, is yellowish brown sandy clay loam. Limestone bedrock is at a depth of about 18 inches.

Demory soils are shallow or very shallow over bedrock and are occasionally flooded. Typically, the surface layer is black muck about 3 inches thick. The subsurface layer, to a depth of about 7 inches, is very dark grayish brown sandy clay loam. The underlying material, to a depth of about 9 inches, is dark grayish brown sandy clay loam. Limestone bedrock is at a depth of about 9 inches.

Waccasassa soils are shallow or very shallow over bedrock and are subject to rare flooding. Typically, the surface is covered by several inches of undecomposed leaf litter. The surface layer is very dark grayish brown sandy clay loam about 2 inches thick. The subsoil, to a depth of about 12 inches, is dark yellowish brown sandy clay loam. Limestone bedrock is at a depth of about 12 inches.

Of minor extent in this map unit are Aripeka, Boca, Bradenton, Chobee, Hallandale, Hicoria, Holopaw, Matmon, and Pineda soils.

Most areas of this map unit are used for the production of pine trees or support natural vegetation and are used only as wildlife habitat.

13. Aripeka-Matmon-Chobee

Nearly level, very poorly drained and somewhat poorly drained, loamy soils that are shallow to very deep over bedrock; some are sandy to a depth of less than 20 inches

This map unit is on low ridges of the coastal limestone shelf in the central part of the county. The landscape is characterized by low knolls and ridges that are transected by numerous creeks and drainageways. The natural vegetation on the knolls and ridges consists mainly of live oak, water oak, laurel oak, eastern redcedar, sweetgum, magnolia, slash pine, and loblolly pine in the overstory and cabbage-palm, greenbrier, yaupon, brackenfern, poison ivy, bluestems, and panicums in the understory. In drainageways and on narrow flood plains the natural vegetation consists mainly of cypress, red maple, sweetbay, sweetgum, and Florida willow in the overstory and pickerelweed, lizard tail, water iris, and scattered cabbage-palm in the understory.

This map unit makes up 5,725 acres, or less than 1 percent of the acreage in the county. It is about 31 percent Aripeka soils, 30 percent Matmon soils, 15 percent Chobee soils, and 24 percent soils of minor extent.

Aripeka soils are somewhat poorly drained and are on knolls and ridges. Typically, the surface layer is dark grayish brown fine sand about 6 inches thick. The subsoil is yellowish brown fine sand to a depth of about 12 inches and strong brown fine sandy loam to a depth of 24 inches. Limestone bedrock is at a depth of about 24 inches.

Matmon soils are somewhat poorly drained and are on knolls and ridges. Typically, the surface layer is very dark grayish brown fine sand about 3 inches thick. The subsurface layer, to a depth of about 6 inches, is brown fine sand. The subsoil, to a depth of about 15 inches, is strong brown sandy clay loam. Limestone bedrock is at a depth of about 15 inches.

Chobee soils are very poorly drained and frequently flooded. They are in drainageways and on narrow flood plains. Typically, the surface layer is very dark brown muck to a depth of about 3 inches and very dark brown fine sandy loam to a depth of 11 inches. The subsoil is sandy clay loam. It is very dark grayish brown to a depth of about 21 inches, light brownish gray to a depth of 28 inches, dark greenish gray to a depth of 54 inches, and a mixture of greenish gray and light greenish gray to a depth of 68 inches. Limestone bedrock is at a depth of about 68 inches.

Of minor extent in this map unit are Boca, Demory, Bradenton, Gator, Hicoria, Holopaw, Pineda, Terra Ceia, Waccasassa, and Wekiva soils.

Most areas of this map unit are used for pasture or the production of pine trees. Other areas are used for cropland or have been subdivided for residential development.

14. Broward-Lutterloh-Zolfo

Nearly level, somewhat poorly drained, sandy soils that are moderately deep to very deep over bedrock; some are loamy at a depth of 40 to 80 inches

This map unit is on low ridges of the coastal limestone shelf that are adjacent to the Withlacoochee River in the southern part of the county. The landscape is characterized by low ridges and some depressions and drainageways. The natural vegetation consists mainly of live oak, slash pine, and loblolly pine in the overstory and pineland threeawn, saw palmetto, gallberry, blackberry, bluestems, running oak, cabbage-palm, and reindeer moss in the understory.

This map unit makes up 3,100 acres, or less than 1 percent of the acreage in the county. It is about 26 percent Broward soils, 26 percent Lutterloh soils, 12 percent Zolfo soils, and 36 percent soils of minor extent.

Typically, the surface layer of the Broward soils is dark gray fine sand about 6 inches thick. The underlying material is a mixture of light yellowish brown and brownish yellow fine sand to a depth of about 10 inches and yellowish brown fine sand to a depth of 25 inches. Limestone bedrock is at a depth of about 25 inches.

Typically, the surface layer of the Lutterloh soils is dark gray fine sand about 9 inches thick. The subsurface layer is light gray fine sand to a depth of about 35 inches and brown fine sand to a depth of 52 inches. The subsoil, to a depth of 61 inches, is light brownish gray fine sandy loam. Soft, crumbly limestone that can be dug with a spade is at a depth of about 61 inches. Limestone bedrock is at a depth of about 78 inches.

Typically, the surface layer of the Zolfo soils is very dark gray sand about 4 inches thick. The subsurface layer is pale brown sand to a depth of about 8 inches, gray sand to a depth of 32 inches, light gray sand to a depth of 50 inches, pale brown sand to a depth of 65 inches, and light brownish gray sand to a depth of 71 inches. The subsoil to a depth of 80 inches or more is very dark grayish brown, organically coated sand.

Of minor extent in this map unit are Adamsville, Aripeka, Bushnell, Hicoria, Jonesville, Matmon, Moriah, Pedro, Placid, Samsula, Seaboard, and Shadeville soils.

Most areas of this map unit have been subdivided for residential development. Other areas support natural vegetation and are used only as wildlife habitat.

Figure 6.—A tidal creek in an area of the Tidewater-Cracker general soil map unit.

Nearly Level, Very Poorly Drained Soils in Tidal Marshes

These soils are dominantly nearly level, very poorly drained, and clayey and mucky. They have bedrock at a depth of 6 to more than 80 inches. They make up 44,020 acres, or about 6 percent of the county. They are in all areas of the tidal marsh, which extends along the coastline from the Withlacoochee River in the south to the Suwannee River in the north and is about 1 to 3 miles wide.

15. Tidewater-Cracker

Nearly level, very poorly drained, clayey and loamy soils that are shallow or very shallow or deep or very deep over bedrock

This map unit is in areas of tidal marsh in the southern part of the county. The landscape is characterized by broad, low tidal flats that are transected by numerous small tidal creeks (fig. 6). The natural vegetation consists mainly of black needlerush, marshhay cordgrass, saltwort, and glasswort.

This map unit makes up 30,820 acres, or about 4 percent of the acreage in the county. It is about 55 percent Tidewater soils, 35 percent Cracker soils, and 10 percent soils of minor extent.

Tidewater soils are deep or very deep over limestone. Typically, the surface layer is very dark brown mucky clay to a depth of about 10 inches, black silty clay to a depth of 24 inches, and black sandy clay loam to a depth of 40 inches. The underlying material, to a depth of 76 inches, is a mixture of black and very dark grayish brown loamy fine sand. Hard limestone bedrock is at a depth of about 76 inches.

Cracker soils are shallow or very shallow over limestone. Typically, the surface layer is black mucky clay to a depth of about 4 inches and very dark gray sandy clay loam to a depth of 12 inches. Hard limestone bedrock is at a depth of about 12 inches.

Of minor extent in this map unit are Demory soils.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat.

16. Tidewater-Wulfert

Nearly level, very poorly drained, clayey and loamy or mucky soils; some are deep or very deep over bedrock

This map unit is in areas of tidal marsh in the northern part of the county. The landscape is characterized by broad, low tidal flats that are transected by numerous small tidal creeks. The natural vegetation consists mainly of black needlerush, marshhay cordgrass, and sawgrass.

This map unit makes up 13,200 acres, or about 2 percent of the acreage in the county. It is about 70 percent Tidewater soils, 12 percent Wulfert soils, and 18 percent soils of minor extent.

Typically, the surface layer of the Tidewater soils is very dark brown mucky clay to a depth of about 10 inches, black silty clay to a depth of 24 inches, and black sandy clay loam to a depth of 40 inches. The underlying material, to a depth of 76 inches, is a mixture of black and very dark grayish brown loamy fine sand. Limestone bedrock is at a depth of about 76 inches.

Typically, the surface layer of the Wulfert soils is very dark brown muck about 30 inches thick. The underlying material is very dark gray mucky loamy fine sand to a depth of about 56 inches and very dark gray fine sand to a depth of 80 inches or more.

Of minor extent in this map unit are Gator, Immokalee, Myakka, Terra Ceia, and Zolfo soils. Immokalee, Myakka, and Zolfo soils are in the higher landscape positions. Gator and Terra Ceia soils are in nontidal positions.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat.

Nearly Level, Very Poorly Drained and Poorly Drained Soils on Flood Plains and Low Flats

These soils are dominantly nearly level and are very poorly drained or poorly drained. Some are sandy throughout, some are loamy throughout, and some have an organic surface layer that is 16 to more than 80 inches thick. These map units make up 26,900 acres, or about 4 percent of the county. They are on the flood plain along the Suwannee River in the northwestern part of the county, on most of the flood plains along the Waccasassa River and Otter Creek in the central part, and in four small areas mostly in the northeastern part.

17. Gator-Chobee-Terra Ceia

Nearly level, very poorly drained, mucky and loamy soils; some are mucky to a depth of 16 to 51 inches over loamy material, some are loamy throughout, and some are mucky throughout

This map unit is on the flood plain along the Suwannee River in the western part of the county and on the flood plains along the Waccasassa River and Otter Creek in the central part. The landscape is characterized by low flats and oxbows that are adjacent to rivers and creeks. The natural vegetation consists mainly of cypress, red maple, sweetbay, sweetgum, and Florida willow in the overstory and pickerelweed, lizard tail, water iris, and scattered cabbage-palm in the understory.

This map unit makes up 21,685 acres, or about 3 percent of the acreage in the county. It is about 34 percent Gator soils, 26 percent Chobee soils, 16 percent Terra Ceia soils, and 24 percent soils of minor extent.

Typically, the surface layer of the Gator soils is black muck to a depth of about 26 inches. The underlying material is very dark gray fine sandy loam to a depth of about 40 inches, gray sandy clay loam to a depth of 52 inches, and light gray fine sand to a depth of 80 inches or more.

Typically, the surface layer of the Chobee soils is fine sandy loam. It is black to a depth of 7 inches and very dark gray to a depth of 11 inches. The subsoil is sandy clay loam. It is dark gray and has common pockets of soft calcium carbonate accumulations to a depth of 37 inches and gray to a depth of 48 inches. The underlying material is greenish gray fine sandy loam to a depth of about 72 inches and dark gray fine sand below this depth.

Typically, the surface layer of the Terra Ceia soils is a mixture of black and dark brown muck to a depth of about 37 inches and black muck to a depth of 80 inches or more.

Of minor extent in this map unit are Albany, Bradenton, Hicoria, Holopaw, Ousley, Pineda, Placid, Popash, and Samsula soils.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat.

18. Hicoria-Placid-Holopaw

Nearly level, poorly drained and very poorly drained, sandy soils; some are loamy at a depth of 20 to 40 inches or 40 to 80 inches

This map unit is on broad, low flats in the eastern,

north-central, and northwestern parts of the county. The landscape is characterized by broad, low flats that are interspersed with shallow depressions and surrounded by higher uplands. The natural vegetation consists mainly of maidencane, chalky bluestem, bushybeard bluestem, sand cordgrass, and waxmyrtle.

This map unit makes up 5,215 acres, or less than 1 percent of the acreage in the county. It is about 42 percent Hicoria soils, 29 percent Placid soils, 11 percent Holopaw soils, and 18 percent soils of minor extent.

Hicoria soils are poorly drained and very poorly drained. Typically, the surface layer is fine sand. It is very dark gray to a depth of about 11 inches and very dark grayish brown to a depth of 17 inches. The subsurface layer, to a depth of about 23 inches, is brown loamy fine sand. The subsoil is sandy clay loam. It is grayish brown to a depth of 30 inches and gray to a depth of 80 inches or more.

Placid soils are very poorly drained. Typically, the surface layer is fine sand. It is black to a depth of about 4 inches and very dark gray to a depth of 19 inches. The underlying material is fine sand. It is very pale brown to a depth of about 26 inches and light gray to a depth of 80 inches or more.

Holopaw soils are poorly drained. Typically, the surface layer is very dark gray fine sand about 3 inches thick. The subsurface layer is fine sand. It is dark gray to a depth of about 17 inches, grayish brown to a depth of 35 inches, and brown to a depth of 54 inches. The subsoil is grayish brown fine sandy loam to a depth of 62 inches and gray sandy clay loam to a depth of 80 inches or more.

Of minor extent in this map unit are Adamsville, Bushnell, Ft. Green, Lochloosa, Lutterloh, Mabel, Moriah, Popash, Sparr, and Tavares soils.

Most areas of this map unit are used for livestock grazing, wildlife habitat, or woodland.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under the heading "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series.* Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Myakka mucky sand, occasionally flooded, is a phase of the Myakka series.

Some map units are made up of two or more major soils. These map units are called soil complexes or undifferentiated groups.

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Levyville-Hague complex is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Gator and Terra Ceia soils, frequently flooded, is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits and Dumps is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

2—Tavares fine sand, 1 to 5 percent slopes. This moderately well drained, very deep, nearly level to gently sloping soil is on uplands and on low knolls and ridges on flatwoods. Individual areas are generally irregular in shape and range from 2 to nearly 1,600 acres in size.

Typically, the surface layer is very dark grayish brown fine sand about 7 inches thick. The underlying material is fine sand. It is brown to a depth of about 41 inches, pale brown to a depth of 58 inches, and white to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Tavares fine sand, 1 to 5 percent slopes, Tavares and similar soils make up about 85 to 99 percent of the mapped areas. Dissimilar soils make up about 1 to 15 percent. On 5 percent of the acreage, the dissimilar soils make up more than 15 percent of the mapped areas.

Included in mapping are soils that are similar to the Tavares soil but have more than 5 percent silt and clay in the 10- to 40-inch control section, have a seasonal high water table at a depth of 20 to 42 inches, do not have a seasonal high water table within a depth of 72 inches, have limestone bedrock at a depth of 60 to 80 inches, or have a dark surface layer that is more than 10 inches thick.

Dissimilar soils that are included with the Tavares soil in mapping occur as small areas of Apopka, Millhopper, Placid, and Sparr soils. Apopka and Millhopper soils are in positions on the landscape similar to those of the Tavares soil. Sparr soils are in the slightly lower landscape positions. Placid soils are in depressions. Apopka and Millhopper soils have a loamy subsoil at a depth of 40 to 80 inches.

In most years the seasonal high water table is at a depth of 42 to 72 inches in the Tavares soil for 1 to 3 months. Permeability is rapid or very rapid. Available water capacity is very low.

Most areas of this map unit are used for pasture or the production of pine trees. Natural vegetation consists mainly of sand live oak, bluejack oak, turkey oak, longleaf pine, and slash pine in the overstory and wiregrass, bluestems, and scattered saw palmetto in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

This soil is moderately suited to cultivated crops. Droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

This soil is well suited to pasture. Seasonal droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are seedling mortality caused by the seasonal droughtiness and the low fertility; the equipment limitation caused by the loose, sandy surface layer; and, in some areas, plant competition. Planting adapted trees, such as slash pine, and planting during the wetter months reduce the seedling mortality rate. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

This soil has only slight limitations affecting sites for residential and commercial buildings and local roads and streets. Wetness is a moderate limitation on sites for septic tank absorption fields. Installing an oversized septic tank absorption field and taking care not to cluster homes and septic systems can help to overcome this limitation and minimize the hazard of ground-water pollution. Limitations affecting recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations. Applications of mulch, applications of fertilizer, and irrigation generally are needed to establish turf grasses.

The capability subclass is IIIs. The woodland ordination symbol is 10S.

3—Orsino fine sand, 0 to 8 percent slopes. This moderately well drained, very deep, nearly level to gently rolling soil is on dunes and ridges. Individual areas are generally circular or elongated and range from 2 to nearly 750 acres in size.

Typically, the surface layer is gray fine sand about 4 inches thick. The subsurface layer is fine sand. It is very pale brown to a depth of about 8 inches and white to a depth of 13 inches. The subsoil is fine sand. It is brownish yellow to a depth of about 48 inches, light yellowish brown to a depth of 58 inches, and brownish yellow to a depth of 70 inches. The underlying material to a depth of 80 inches or more is white fine sand.

On 95 percent of the acreage mapped as Orsino fine sand, 0 to 8 percent slopes, Orsino and similar soils make up about 88 to 100 percent of the mapped areas. Dissimilar soils make up less than about 12 percent. On 5 percent of the acreage, the dissimilar soils make up more than 12 percent of the mapped areas.

Included in mapping are soils that are similar to the Orsino soil but do not have a leached subsurface layer; have a surface layer that is made up dominantly of shell fragments; have limestone bedrock below a depth of 60 inches; have a dark, organically stained subsoil; have a seasonal high water table at a depth of 20 to 42 inches;

or do not have a seasonal high water table within a depth of 60 inches.

Dissimilar soils that are included with the Orsino soil in mapping occur as small areas of Immokalee, Myakka, Otela, Placid, Pompano, Popash, Samsula, Smyrna, and Sparr soils and soils that have limestone bedrock within a depth of 60 inches. Placid, Popash, and Samsula soils are in depressions. Immokalee, Myakka, Pompano, Smyrna, and Sparr soils are in the slightly lower landscape positions. Otela soils are in positions on the landscape similar to those of the Orsino soil. They have a loamy subsoil at a depth of 40 to 80 inches.

In most years the seasonal high water table is at a depth of 48 to 60 inches in the Orsino soil for 1 to 6 months. Permeability is very rapid. Available water capacity is very low.

Most areas of this map unit are used for wildlife habitat or the production of pine trees. Natural vegetation consists mainly of sand live oak, turkey oak, longleaf pine, sand pine, and slash pine in the overstory and saw palmetto, pineland threeawn, bluestems, and reindeer moss in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

This soil is very poorly suited to cultivated crops. Droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. In some areas, however, irrigation may be difficult to install because of the slope. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

This soil is poorly suited to pasture. Prolonged droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Pastures should be established or renovated during the wetter months. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are seedling mortality caused by the prolonged droughtiness and the low fertility and the equipment limitation caused by the loose, sandy surface layer. Planting adapted trees, such as slash pine, and planting during the wetter months reduce the seedling mortality rate. Establishing a close-growing cover crop before planting can help to stabilize the sandy surface layer, improve trafficability, and increase the available water capacity of the topsoil. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation.

This soil has only slight limitations affecting sites for residential buildings and local roads and streets. In areas that have slopes of 5 percent or more, the limitations affecting commercial buildings are moderate. Wetness is a moderate limitation on sites for septic tank absorption fields. Installing an oversized septic tank absorption field and taking care not to cluster homes and septic systems can help to overcome this limitation and minimize the hazard of ground-water pollution. Limitations affecting recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations. Applications of mulch, applications of fertilizer, and irrigation generally are needed to establish turf grasses.

The capability subclass is VIs. The woodland ordination symbol is 8S.

4—Millhopper fine sand, 1 to 5 percent slopes. This moderately well drained, very deep, nearly level to gently sloping soil is on uplands. Individual areas are generally irregular in shape and range from 3 to nearly 500 acres in size.

Typically, the surface layer is dark gray fine sand to a depth of about 4 inches and very dark gray fine sand to a depth of 8 inches. The subsurface layer is fine sand. It is pale brown to a depth of about 18 inches, very pale brown to a depth of 55 inches, and brownish yellow to a depth of about 63 inches. The subsoil to a depth of 80 inches or more is yellowish brown sandy clay loam.

On most of the acreage mapped as Millhopper fine sand, 1 to 5 percent slopes, Millhopper and similar soils make up more than 85 percent of the mapped areas. Dissimilar soils make up less than 15 percent.

Included in mapping are soils that are similar to the Millhopper soil but do not have a seasonal high water table within a depth of 72 inches, have a seasonal high water table at a depth of 20 to 42 inches, or have a loamy subsoil at a depth of 20 to 40 inches.

Dissimilar soils that are included with the Millhopper soil in mapping occur as small areas of Adamsville,

Astatula, Candler, Lochloosa, Orlando, Placid, Popash, and Tavares soils. Astatula, Candler, Orlando, and Tavares soils are in positions on the landscape similar to those of the Millhopper soil. Adamsville and Lochloosa soils are in the slightly lower landscape positions. Placid and Popash soils are in depressions. Candler, Orlando, and Tavares soils are sandy to a depth of 80 inches or more.

In most years the seasonal high water table is perched at a depth of 48 to 72 inches in the Millhopper soil for 1 to 3 months. Permeability is slow to moderate. Available water capacity is low.

Most areas of this map unit are used for wildlife habitat, pasture, or the production of pine trees. Natural vegetation consists mainly of live oak, turkey oak, longleaf pine, and slash pine in the overstory and blackberry, pineland threeawn, bluestems, Florida rosemary, brackenfern, and scattered saw palmetto in the understory. This map unit generally is in the Upland Hardwood Hammocks or Longleaf Pine-Turkey Oak Hills ecological community *(24)*.

This soil is moderately suited to cultivated crops. Prolonged droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. In many areas, however, irrigation may be impractical because of a lack of water. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

This soil is well suited to pasture. The prolonged droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Pastures should be established or renovated during the wetter months. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are seedling mortality caused by the seasonal droughtiness and the low fertility; the equipment limitation caused by the loose, sandy surface layer; and, in some areas, plant competition. Planting adapted trees, such as slash pine, and planting during the wetter months reduce the seedling mortality rate. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

This soil has only slight limitations affecting sites for residential and commercial buildings and local roads and streets. Wetness is a moderate limitation on sites for septic tank absorption fields. Installing an oversized septic tank absorption field can help to overcome this limitation. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations. Applications of mulch, applications of fertilizer, and irrigation generally are needed to establish turf grasses.

The capability subclass is IIIs. The woodland ordination symbol is 10S.

5—Immokalee fine sand. This poorly drained, very deep, nearly level soil is on flatwoods. Individual areas are generally irregular in shape and range from 2 to nearly 1,700 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 9 inches thick. The subsurface layer is fine sand. It is gray to a depth of about 16 inches and light gray to a depth of 38 inches. The subsoil is very dark grayish brown, organically coated fine sand to a depth of about 43 inches and dark brown fine sand to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Immokalee fine sand, Immokalee and similar soils make up about 91 to 100 percent of the mapped areas. Dissimilar soils make up less than 9 percent. On 5 percent of the acreage, the dissimilar soils make up more than 9 percent of the mapped areas.

Included in mapping are soils that are similar to the Immokalee soil but have an organically stained subsoil that is within a depth of 30 inches or below a depth of 50 inches, do not have an organically stained subsoil, have limestone bedrock below a depth of 60 inches, have a loamy subsoil below a depth of 40 inches, or have a sandy texture in the surface layer.

Dissimilar soils that are included with the Immokalee soil in mapping occur as small areas of Adamsville, Cassia, Hicoria, Janney, Pineda, Placid, Pomello, Popash, and Zolfo soils and soils that have limestone bedrock within a depth of 60 inches. Adamsville, Cassia, Pomello, and Zolfo soils are in the slightly

higher landscape positions. Pineda and Janney soils are in positions on the landscape similar to those of the Immokalee soil. Hicoria, Placid, and Popash soils are in depressions. Pineda soils do not have an organically stained subsoil. They have a loamy subsoil within a depth of 40 inches. Janney soils have limestone bedrock within a depth of 40 inches.

In most years the seasonal high water table is at a depth of 6 to 18 inches in the Immokalee soil for 1 to 4 months. The water table may recede to a depth of about 60 inches during droughty periods. Permeability is moderate. Available water capacity is low.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture or wildlife habitat. Natural vegetation consists mainly of slash pine and longleaf pine in the overstory and saw palmetto, pineland threeawn, waxmyrtle, gallberry, fetterbush, and bluestems in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

This soil is poorly suited to cultivated crops. Wetness during the growing season, occasional droughtiness, and low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during the growing season. Bedding is necessary for most row crops. A well designed sprinkler irrigation system can help to maintain optimum soil moisture during droughty periods. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

This soil is moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods or extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are seedling mortality, plant competition, and the equipment limitation caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility.

Wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw. The woodland ordination symbol is 8W.

6—Candler fine sand, 1 to 5 percent slopes. This excessively drained, very deep, nearly level to gently undulating soil is on uplands. Individual areas are generally irregular in shape and range from 3 to more than 10,000 acres in size.

Typically, the surface layer is dark grayish brown fine sand about 6 inches thick. The subsurface layer, to a depth of about 60 inches, is very pale brown fine sand. Below this to a depth of 80 inches or more is a mixed subsurface layer and subsoil of very pale brown fine sand that has common thin, horizontal yellowish brown lamellae.

On 80 percent of the acreage mapped as Candler fine sand, 1 to 5 percent slopes, Candler and similar soils make up about 78 to 97 percent of the mapped areas. Dissimilar soils make up about 3 to 22 percent. On 20 percent of the acreage, the dissimilar soils make up more than 22 percent of the mapped areas.

Included in mapping are soils that are similar to the Candler soil but have more than 5 percent silt and clay in the 10- to 40-inch control section, do not have lamellae within a depth of 80 inches, have a seasonal high water table at a depth of 40 to 72 inches, or have a dark surface layer that is more than 7 inches thick. Also included are small areas that have slopes of more than 5 percent.

Dissimilar soils that are included with the Candler soil in mapping occur as small areas of Adamsville, Apopka, Millhopper, Placid, Popash, and Sparr soils and soils in pits and dumps. Apopka and Millhopper soils are in positions on the landscape similar to those of the Candler soil. Adamsville and Sparr soils are in the slightly lower landscape positions. Placid and Popash soils are in depressions. Apopka and Millhopper soils have a loamy subsoil at a depth of 40 to 80 inches.

Throughout the year the seasonal high water table is below a depth of 72 inches in the Candler soil. Permeability is rapid. Available water capacity is very low.

Most areas of this map unit are idle and are used only as wildlife habitat. Other areas are used for pasture, cropland, or the production of pine trees or have been subdivided for residential development. Natural vegetation consists mainly of turkey oak, live oak, bluejack oak, longleaf pine, and slash pine in the overstory and wiregrass, bluestems, blackberry, Spanish bayonet, Florida rosemary, and scattered saw palmetto in the understory. This map unit generally is in the Longleaf Pine-Turkey Oak Hills ecological community *(24)*.

This soil is poorly suited to cultivated crops. Prolonged droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. In many areas, however, irrigation may be impractical because of a lack of water. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

This soil is poorly suited to pasture. The prolonged droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Pastures should be established or renovated during the wetter months. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are seedling mortality caused by the prolonged droughtiness and the low fertility and the equipment limitation caused by the loose, sandy surface layer. Planting adapted trees, such as sand pine, and planting during the wetter months reduce the seedling mortality rate. Establishing a close-growing cover crop before planting can help to stabilize the sandy surface layer, improve trafficability, and increase the available water capacity of the topsoil. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation.

This soil has only slight limitations affecting sites for septic tank absorption fields, residential and commercial buildings, and local roads and streets. Taking care not to cluster homes and septic systems minimizes the hazard of ground-water pollution. Limitations affecting recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of droughtiness and traffic can help to stabilize the surface layer. Applications of mulch, applications of fertilizer, frequent irrigation, and restricted access are generally required.

The capability subclass is IVs. The woodland ordination symbol is 8S.

7—Candler-Apopka complex, 1 to 5 percent slopes. This map unit consists of an excessively drained Candler soil and a well drained Apopka soil. These very deep, nearly level and gently undulating soils are on uplands. Individual areas are generally irregular in shape and range from 3 to nearly 2,000 acres in size.

Typically, the surface layer of the Candler soil is very dark grayish brown fine sand about 8 inches thick. The subsurface layer is fine sand. It is light yellowish brown to a depth of about 19 inches, brownish yellow to a depth of 37 inches, and very pale brown to a depth of 52 inches. Below this to a depth of 80 inches or more is a mixed subsurface layer and subsoil of very pale brown fine sand that has many thin, horizontal lenses of brownish yellow loamy fine sand.

Typically, the surface layer of the Apopka soil is grayish brown fine sand about 4 inches thick. The subsurface layer is yellowish brown fine sand to a depth of about 10 inches, light yellowish brown fine sand to a depth of 45 inches, very pale brown fine sand to a depth of 60 inches, and reddish yellow loamy fine sand to a depth of 71 inches. The subsoil to a depth of 80 inches or more is strong brown sandy clay loam.

On 95 percent of the acreage mapped as Candler-Apopka complex, 1 to 5 percent slopes, Candler, Apopka, and similar soils make up about 93 to 100 percent of the mapped areas. Dissimilar soils make up less than 7 percent. On 5 percent of the acreage, the

dissimilar soils make up more than 7 percent of the mapped areas. Generally, the mapped areas average about 70 percent Candler and similar soils and 27 percent Apopka and similar soils.

Included in mapping are soils that are similar to the Candler soil but do not have sandy or loamy lenses within a depth of 80 inches, have more than 5 percent silt and clay between depths of 10 and 40 inches, have a dark surface layer that is more than 10 inches thick, or have a seasonal high water table at a depth of 40 to 72 inches. Also included are soils that are similar to the Apopka soil but have a seasonal high water table at a depth of 40 to 72 inches, have a dark surface layer that is more than 8 inches thick, or have chert stones or boulders below a depth of 60 inches. Also included are small areas of soils that are similar to the Candler and Apopka soils but have slopes of more than 5 percent.

Dissimilar soils that are included with the Candler and Apopka soils in mapping occur as small areas of Adamsville, Bonneau, Lochloosa, Placid, Popash, and Sparr soils and soils that have stones or boulders within a depth of 60 inches. Bonneau soils are in positions on the landscape similar to those of the Candler and Apopka soils. Adamsville, Lochloosa, and Sparr soils are in the lower landscape positions. Placid and Popash soils are in depressions. Bonneau soils are moderately well drained and have a loamy subsoil within a depth of 40 inches.

The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Candler and Apopka soils and of the similar soils are fairly consistent in most mapped areas.

Throughout the year the seasonal high water table is below a depth of 72 inches in the Candler and Apopka soils. Permeability is rapid in the Candler soil and moderate in the Apopka soil. Available water capacity is very low in both soils.

Most areas of this map unit are used for pasture or the production of pine trees. Other areas are used for cropland or have been subdivided for residential development. Natural vegetation consists mainly of longleaf pine, slash pine, turkey oak, live oak, post oak, and bluejack oak in the overstory and wiregrass, bluestems, blackberry, cabbage-palm, Spanish bayonet, Florida rosemary, and scattered saw palmetto in the understory. This map unit generally is in the Longleaf Pine-Turkey Oak Hills ecological community *(24)*.

These soils are poorly suited to cultivated crops. Prolonged droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. In many areas, however, irrigation may be impractical because of a lack of water. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

These soils are moderately suited to pasture. The prolonged droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Pastures should be established or renovated during the wetter months. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are seedling mortality caused by the seasonal droughtiness and the low fertility; the equipment limitation caused by the loose, sandy surface layer; and, in some areas, plant competition. Planting adapted trees, such as slash pine, and planting during the wetter months reduce the seedling mortality rate. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

These soils have only slight limitations affecting sites for septic tank absorption fields, residential and commercial buildings, and local roads and streets. Taking care not to cluster homes and septic systems minimizes the hazard of ground-water pollution. Limitations affecting recreational facilities are severe because of the loose, sandy surface layer. Establishing turf grasses that are tolerant of droughtiness and traffic can help to stabilize the surface layer. Applications of mulch, applications of fertilizer, frequent irrigation, and restricted access are generally required.

The capability subclass is IVs for the Candler soil and IIIs for the Apopka soil. The woodland ordination symbol is 8S for the Candler soil and 10S for the Apopka soil.

8—Smyrna fine sand. This poorly drained, very deep, nearly level soil is on flatwoods. Individual areas are generally irregular in shape and range from 2 to

more than 10,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown fine sand about 5 inches thick. The subsurface layer is fine sand. It is gray to a depth of about 9 inches and light brownish gray to a depth of 19 inches. The subsoil is black, organically coated fine sand to a depth of about 23 inches and a mixture of dark yellowish brown and very dark grayish brown fine sand to a depth of 28 inches. The underlying material is very pale brown fine sand to a depth of about 57 inches and white fine sand to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Smyrna fine sand, Smyrna and similar soils make up about 87 to 100 percent of the mapped areas. Dissimilar soils make up less than about 13 percent. On 5 percent of the acreage, the dissimilar soils make up more than 13 percent of the mapped areas.

Included in mapping are soils that are similar to the Smyrna soil but have an organically coated subsoil below a depth of 20 inches, do not have an organically coated subsoil, do not have a subsurface layer, have a loamy subsoil below a depth of 40 inches, or have limestone bedrock below a depth of 60 inches.

Dissimilar soils that are included with the Smyrna soil in mapping occur as small areas of Adamsville, Boca, Cassia, Pineda, Placid, Pomello, Popash, Samsula, Wauchula, and Zolfo soils and soils that have limestone bedrock within a depth of 60 inches. Boca, Pineda, and Wauchula soils are in positions on the landscape similar to those of the Smyrna soil. Adamsville, Cassia, Pomello, and Zolfo soils are in the slightly higher landscape positions. Placid, Popash, and Samsula soils are in depressions. Boca, Pineda, and Wauchula soils have a loamy subsoil within a depth of 40 inches. Boca and Pineda soils do not have an organically stained subsoil, and Boca soils have limestone bedrock within a depth of 40 inches.

In most years the seasonal high water table is at a depth of 6 to 18 inches in the Smyrna soil for 1 to 4 months. The water table may recede to a depth of about 60 inches during droughty periods. Permeability is moderate or moderately rapid. Available water capacity is low.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture, cropland, or wildlife habitat. Natural vegetation consists mainly of slash pine and longleaf pine in the overstory and saw palmetto, pineland threeawn, waxmyrtle, fetterbush, gallberry, and bluestems in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

This soil is poorly suited to cultivated crops. Wetness during the growing season, occasional droughtiness, and the low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during the growing season. Bedding is necessary for most row crops. A well designed sprinkler irrigation system can help to maintain optimum soil moisture during droughty periods. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

This soil is moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods or extended dry periods helps to avoid damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and

establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw. The woodland ordination symbol is 10W.

9—Pomona fine sand. This poorly drained, very deep, nearly level soil is on flatwoods. Individual areas are generally irregular in shape and range from 2 to nearly 1,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of about 23 inches, is gray fine sand. The upper subsoil is dark brown, organically coated fine sand to a depth of about 27 inches and dark yellowish brown fine sand to a depth of 30 inches. Below this, to a depth of about 61 inches, are intervening layers of very pale brown fine sand and grayish brown loamy fine sand. The lower subsoil to a depth of 80 inches or more is gray sandy clay loam.

On 95 percent of the acreage mapped as Pomona fine sand, Pomona and similar soils make up about 89 to 100 percent of the mapped areas. Dissimilar soils make up less than 11 percent. On 5 percent of the acreage, the dissimilar soils make up more than 11 percent of the mapped areas.

Included in mapping are soils that are similar to the Pomona soil but have an organically coated subsoil that is below a depth of 30 inches, do not have an organically coated subsoil, do not have a subsurface layer, do not have a loamy subsoil, or have limestone bedrock below a depth of 60 inches.

Dissimilar soils that are included with the Pomona soil in mapping occur as small areas of Adamsville, Bivans, Boca, Bradenton, Ft. Green, Hicoria, Pineda, Placid, Popash, Sparr, Wauchula, and Zolfo soils and soils that have limestone bedrock within a depth of 60 inches. Adamsville, Bivans, Ft. Green, Sparr, and Zolfo soils are in the slightly higher landscape positions. Boca, Bradenton, Pineda, and Wauchula soils are in positions on the landscape similar to those of the Pomona soil. Hicoria, Placid, and Popash soils are in depressions. Boca, Bradenton, and Pineda soils do not have an organically stained subsoil and have a loamy subsoil within a depth of 40 inches. Wauchula soils also have a loamy subsoil within a depth of 40 inches.

In most years the seasonal high water table is at a depth of 6 to 18 inches in the Pomona soil for 1 to 4 months. The water table may recede to a depth of about 60 inches during droughty periods. Permeability is moderately slow or moderate. Available water capacity is low.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture, cropland, or wildlife habitat. Natural vegetation consists mainly of slash pine, longleaf pine, and loblolly pine in the overstory and saw palmetto, pineland threeawn, bluestems, waxmyrtle, fetterbush, and gallberry in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

This soil is poorly suited to cultivated crops. Wetness during the growing season, occasional droughtiness, and low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during the growing season. Bedding is necessary for most row crops. A well designed sprinkler irrigation system can help to maintain optimum soil moisture during droughty periods. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

This soil is moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods or extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil

material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw. The woodland ordination symbol is 10W.

10—Placid fine sand. This very poorly drained, very deep, nearly level soil is on marsh prairies and low flatwoods. Individual areas are generally irregular in shape and range from 2 to nearly 700 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is black fine sand to a depth of about 4 inches and very dark gray fine sand to a depth of 19 inches. The underlying material is very pale brown fine sand to a depth of about 26 inches and light gray fine sand to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Placid fine sand, Placid and similar soils make up about 76 to 100 percent of the mapped areas. Dissimilar soils make up less than 24 percent. On 5 percent of the acreage, the dissimilar soils make up more than 14 percent of the mapped areas.

Included in mapping are soils that are similar to the Placid soil but have an organically coated subsoil, have a loamy subsoil below a depth of 40 inches, do not have a dark surface layer that is more than 10 inches thick, have a surface layer of loamy fine sand or mucky fine sand that is more than 3 inches thick, or have limestone bedrock below a depth of 60 inches.

Dissimilar soils that are included with the Placid soil in mapping occur as small areas of Adamsville, Pineda, Popash, Samsula, and Zolfo soils and soils that are in depressions or that have limestone bedrock within a depth of 60 inches. Adamsville and Zolfo soils are in the slightly higher landscape positions. Pineda soils are in positions on the landscape similar to those of the Placid soil. Popash and Samsula soils are in depressions. Pineda soils have a loamy subsoil within a depth of 40 inches.

In most years the seasonal high water table is within a depth of 12 inches in the Placid soil for more than 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is rapid. Available water capacity is low.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture, cropland, or wildlife habitat. Natural vegetation consists mainly of slash pine, loblolly pine, and sweetgum in the overstory and saw palmetto, gallberry, fetterbush, waxmyrtle, wiregrass, bluestems, and sedges in the understory. Some areas do not have a woody overstory, and the native vegetation consists mainly of grasses and shrubs, including bluestems, waxmyrtle, maidencane, and sand cordgrass. This map unit generally is in the North Florida Flatwoods or Slough ecological community *(24)*.

This soil is poorly suited to cultivated crops. Wetness during the growing season is the main management concern. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Bedding is necessary for most row crops. Proper seedbed preparation and weed control are needed to control competing vegetation.

This soil is moderately suited to pasture. The wetness is the main management concern. It limits the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is high. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting

septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IIIw. The woodland ordination symbol is 11W.

11—Placid and Samsula soils, depressional. These very poorly drained, very deep, nearly level soils are in depressions on flatwoods. They are ponded. Individual areas are generally oval or irregular in shape and range from 2 to nearly 2,000 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer of the Placid soil is black muck to a depth of about 3 inches and very dark gray fine sand to a depth of 14 inches. The underlying material is light gray fine sand to a depth of about 24 inches, brown fine sand to a depth of 45 inches, and very pale brown fine sand to a depth of 80 inches.

Typically, the surface layer of the Samsula soil is dark brown muck to a depth of about 6 inches and black muck to a depth of 47 inches. The underlying material is grayish brown fine sand to a depth of about 62 inches and light brownish gray fine sand to a depth of 80 inches or more.

Some areas of the map unit are made up of Placid and similar soils, some are made up of Samsula and similar soils, and some are made up of both soils. The relative proportion of the combinations of the soils varies. Areas of the individual soils are large enough to map separately, but because of present and predicted use they were mapped as one unit.

On 95 percent of the acreage mapped as Placid and Samsula soils, depressional, Placid, Samsula, and similar soils make up about 88 to 100 percent of the map unit. Dissimilar soils make up less than 12 percent. On 5 percent of the acreage, the dissimilar soils make up more than 12 percent of the mapped areas.

Included in mapping are soils that are similar to the Placid soil but have an organic surface layer that is less than 3 inches thick; have a dark, organically coated subsoil or a loamy subsoil below a depth of 20 inches; do not have a dark surface layer as much as 10 inches in thickness; or have bedrock between depths of 40 and 80 inches. Also included are soils that are similar to the Samsula soil but have a loamy layer or a dark, organically coated, sandy layer below the organic surface layer; have an organic surface layer that is more than 51 inches thick or less than 16 inches thick; have loamy material underlying the organic surface layer; are more alkaline in the surface layer; or have bedrock between depths of 40 and 80 inches.

Dissimilar soils that are included with the Placid and Samsula soils in mapping occur as small areas of Chobee, Holopaw, Myakka, Pineda, Pomona, Pompano, and Smyrna soils and soils that have bedrock at a depth of 20 to 40 inches. Chobee soils are in positions on the landscape similar to those of the Placid and Samsula soils. Holopaw, Myakka, Pineda, Pomona, Pompano, and Smyrna soils are in the slightly higher landscape positions. Chobee soils are loamy throughout.

During most years the seasonal high water table is above the surface in the Placid and Samsula soils for more than 6 months and is within a depth of 12 inches during the rest of the year. Permeability is rapid in both soils. Available water capacity is low in the Placid soil and high in the Samsula soil.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of cypress, red maple, sweetbay, sweetgum, and Florida willow in the overstory and pickerelweed, lizard's-tail, water iris, and scattered cabbage-palm in the understory. Some areas do not have a woody overstory and support thick stands of sawgrass or maidencane. This map unit generally is in the Swamp Hardwood, Cypress Swamp, or Sawgrass Marsh ecological community *(24)*.

These soils are not suited to and generally are not used for cropland, pasture, or the production of pine trees. Limitations, including ponding, are impractical to overcome under normal circumstances.

The ponding is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including drainage systems and the addition of large amounts of fill, are necessary to overcome this limitation.

The capability subclass is VIIw. The woodland ordination symbol is 2W.

12—Otela-Candler complex, 1 to 5 percent slopes. This map unit consists of a moderately well drained Otela soil and an excessively drained Candler soil. These very deep, nearly level to gently sloping soils are on karst uplands. Individual areas are generally irregular in shape and range from 5 to more than 10,000 acres in size.

Typically, the surface layer of the Otela soil is dark grayish brown fine sand about 8 inches thick. The subsurface layer is fine sand. It is brown to a depth of

about 21 inches, very pale brown to a depth of 32 inches, and white to a depth of 50 inches. Below this is a mixed subsurface layer and subsoil that is brownish yellow fine sandy loam to a depth of about 61 inches, brownish yellow sandy clay loam to a depth of 68 inches, and light gray sandy clay loam to a depth of 80 inches or more.

Typically, the surface layer of the Candler soil is grayish brown fine sand about 7 inches thick. The subsurface layer is grayish brown fine sand to a depth of about 14 inches, pale brown fine sand to a depth of 30 inches, and very pale brown fine sand to a depth of 75 inches. Below this to a depth of 80 inches or more is a mixed subsurface layer and subsoil of white fine sand that has common thin, horizontal lenses of yellowish brown loamy fine sand.

Generally, the mapped areas average about 56 percent Otela and similar soils and 33 percent Candler and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Otela and Candler soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Otela-Candler complex, 1 to 5 percent slopes, Otela, Candler, and similar soils make up about 82 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 18 percent. On 5 percent of the acreage, the dissimilar soils make up more than 18 percent of the mapped areas.

Included in mapping are soils that are similar to the Otela soil but have a dark surface layer that is more than 10 inches thick, have bedrock at a depth of 50 to 60 inches, have a seasonal high water table at a depth of 20 to 42 inches, or do not have a seasonal high water table within a depth of 72 inches. Also included are soils that are similar to the Candler soil but have more than 5 percent silt and clay between depths of 10 and 40 inches, have a dark surface layer that is more than 8 inches thick, do not have sandy or loamy lenses within a depth of 80 inches, or have a seasonal high water table at a depth of 40 to 72 inches.

Dissimilar soils that are included with the Otela and Candler soils in mapping occur as small areas of Adamsville, Bonneau, Bushnell, Hague, Jonesville, Moriah, Placid, Popash, and Shadeville soils. Bonneau, Hague, Jonesville, and Shadeville soils are in positions on the landscape similar to those of the Otela and Candler soils. Adamsville, Bushnell, and Moriah soils are in the lower landscape positions. Placid and Popash soils are in depressions. Bonneau, Hague, Jonesville, and Shadeville soils have a loamy subsoil within a depth of 40 inches. Jonesville soils have limestone bedrock within a depth of 40 inches.

In most years the seasonal high water table is perched at a depth of 48 to 72 inches in the Otela soil for 1 to 4 months. It is below a depth of 72 inches in the Candler soil throughout the year. Permeability is slow or moderately slow in the Otela soil and rapid in the Candler soil. Available water capacity is low in the Otela soil and very low in the Candler soil.

Most areas of this map unit are used as pasture or cropland. Other areas are used for the production of pine trees or have been subdivided for residential development. Natural vegetation consists mainly of live oak, laurel oak, magnolia, slash pine, longleaf pine, and scattered turkey oak in the overstory and blackberry, pineland threeawn, greenbrier, brackenfern, bluestems, and scattered saw palmetto and cabbage-palm in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are moderately suited to cultivated crops. Droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

These soils are well suited to pasture. Seasonal droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Pastures should be established or renovated during the wetter months. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are seedling mortality caused by the seasonal droughtiness and the low fertility; the equipment limitation caused by the loose, sandy surface layer; and, in some areas, plant competition. Planting adapted trees, such as slash pine, and planting during the wetter months reduce the seedling mortality rate. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally

are adequate to control competing vegetation and to maintain accessibility.

These soils have only slight limitations affecting sites for residential and commercial buildings and local roads and streets. The Otela soil is moderately limited as a site for septic tank absorption fields because of wetness and the slow or moderately slow permeability in the subsoil. The Candler soil is slightly limited as a site for septic tank absorption fields. Careful site investigation is needed. Installing an oversized septic tank absorption field and avoiding the clustering of homes and septic systems can help to overcome the limitations and minimize the hazard of ground-water pollution. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations. Applications of mulch, applications of fertilizer, and irrigation generally are needed to establish turf grasses.

The capability subclass is IIIs for the Otela soil and IVs for the Candler soil. The woodland ordination symbol is 10S for the Otela soil and 8S for the Candler soil.

13—Wekiva fine sand. This poorly drained, shallow to moderately deep, nearly level soil is on low ridges. Individual areas are generally irregular in shape and range from 2 to more than 10,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of about 9 inches, is grayish brown fine sand. The subsoil, to a depth of about 18 inches, is yellowish brown sandy clay loam. Below this is limestone bedrock.

On 90 percent of the acreage mapped as Wekiva fine sand, Wekiva and similar soils make up about 75 to 100 percent of the mapped areas. Dissimilar soils make up less than 25 percent. On 10 percent of the acreage, the dissimilar soils make up more than 25 percent of the mapped areas.

Included in mapping are soils that are similar to the Wekiva soil but do not have a sandy surface layer that is 7 or more inches thick, have limestone bedrock below a depth of 30 inches or at a depth of 4 to 9 inches, do not have a loamy subsoil, or have a loamy subsoil at a depth of 20 to 40 inches.

Dissimilar soils that are included with the Wekiva soil in mapping occur as small areas of Aripeka, Bradenton, Chobee, Hicoria, Holopaw, Matmon, Moriah, and Pineda soils and soils that have limestone bedrock within a depth of 4 inches. Aripeka, Matmon, and Moriah soils are in the slightly higher landscape positions. Bradenton, Holopaw, and Pineda soils are in positions on the landscape similar to those of the Wekiva soil. Chobee soils are in the lower landscape positions, and Hicoria soils are in depressions. Bradenton, Holopaw, and Pineda soils do not have limestone bedrock within a depth of 40 inches and do not have a loamy subsoil within a depth of 20 inches.

In most years the seasonal high water table is within a depth of 12 inches in the Wekiva soil for 2 to 6 months. It is above the surface for 1 to 2 weeks following heavy rains. The water table recedes into crevices and solution holes in the bedrock during droughty periods. Permeability is moderately slow. Available water capacity is very low.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture or wildlife habitat. Natural vegetation consists mainly of slash pine, loblolly pine, laurel oak, sweetgum, cedar, and magnolia in the overstory and cabbage-palm, saw palmetto, greenbrier, waxmyrtle, pineland threeawn, and bluestems in the understory. This map unit generally is in the Wetland Hardwood Hammocks ecological community *(24)*.

This soil is poorly suited to cultivated crops. The main management concerns are a restricted root zone, the depth to bedrock, and wetness, which may delay planting. Bedding and installing surface ditches generally are needed if row crops are grown, but special equipment may be needed because of the limited depth to bedrock. During droughty periods, the water table is below the bedrock, and thus sufficient moisture is not available to plant roots. Special cultivation equipment may be needed because of the limited depth to bedrock. Proper seedbed preparation and weed control are needed to control competing vegetation.

This soil is moderately suited to pasture. The main management concerns are the wetness and the restricted root zone. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can help to remove excess water more rapidly during wet periods, but special equipment may be needed because of the limited depth to bedrock. During droughty periods, the water table is below the bedrock, and thus sufficient moisture is not available to plant roots. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods or extended dry periods helps to prevent damage to plant roots. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is low. The main management concerns are the equipment limitation, seedling mortality, plant

competition, and windthrow, which is caused by the wetness and the depth to bedrock. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Because of the shallowness to bedrock, specialized equipment may be needed for proper site preparation and tree planting activities. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine or loblolly pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. Thinning the hardwood overstory instead of clearcutting or leaving some rows of unharvested trees as windbreaks reduces the hazard of windthrow. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The wetness and the depth to bedrock are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and most recreational facilities. Careful site investigation is needed to locate suitably large areas that are deep enough over bedrock. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets, but special equipment may be needed because of the limited depth to bedrock. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw. The woodland ordination symbol is 8W.

14—Shadeville-Otela complex, 1 to 5 percent slopes. This map unit consists of a deep or very deep Shadeville soil and a very deep Otela soil. These moderately well drained, nearly level to gently sloping soils are on karst uplands. Individual areas are generally irregular in shape and range from 4 to nearly 2,600 acres in size.

Typically, the surface layer of the Shadeville soil is very dark grayish brown fine sand about 8 inches thick. The subsurface layer is dark yellowish brown fine sand to a depth of about 27 inches and yellow fine sand to a depth of 35 inches. The subsoil is strong brown fine sandy loam to a depth of about 60 inches and light gray fine sandy loam to a depth of 64 inches. White limestone bedrock is at a depth of about 64 inches.

Typically, the surface layer of the Otela soil is dark grayish brown fine sand about 9 inches thick. The subsurface layer is brown fine sand to a depth of about 16 inches, pale brown fine sand to a depth of 21 inches, very pale brown fine sand to a depth of 50 inches, and white fine sand to a depth of 60 inches. The subsoil is yellowish brown fine sandy loam to a depth of about 66 inches, yellowish brown sandy clay loam to a depth of 72 inches, and brownish yellow sandy clay loam to a depth of 80 inches or more.

Generally, the mapped areas average about 50 percent Shadeville and similar soils and 31 percent Otela and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Shadeville and Otela soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as Shadeville-Otela complex, 1 to 5 percent slopes, Shadeville, Otela, and similar soils make up about 75 to 86 percent of the mapped areas. Dissimilar soils make up about 14 to 25 percent. On 20 percent of the acreage, the dissimilar soils make up more than 25 percent of the mapped areas.

Included in mapping are soils that are similar to the Shadeville soil but do not have bedrock within a depth of 72 inches, have bedrock at a depth of 20 to 40 inches, have a dark surface layer that is more than 10 inches thick, contain more than 35 percent clay in the upper 20 inches of the subsoil, or have a seasonal high water table at a depth of 20 to 48 inches. Also included are soils that are similar to the Shadeville and Otela soils but have sandy materials underlying the subsoil, have a dark surface layer that is more than 10 inches thick, have a seasonal high water table at a depth of 20 to 40 inches, do not have a seasonal high water table within a depth of 72 inches, or have base saturation of less than 35 percent in the lower part of the subsoil. Also included are soils that are similar to the Otela soil but have strong brown or reddish yellow colors in the subsoil, are sandy to a depth of 80 inches or more, or have a seasonal high water table at a depth of 20 to 42 inches.

Dissimilar soils that are included with the Shadeville and Otela soils in mapping occur as small areas of

Adamsville, Bushnell, Levyville, Mabel, Micanopy, Pedro, and Seaboard soils. Bushnell, Levyville, Mabel, Micanopy, Pedro, and Seaboard soils are in positions on the landscape similar to those of the Shadeville and Otela soils. Adamsville soils are in the slightly lower landscape positions. Bushnell, Levyville, Mabel, Micanopy, and Pedro soils have a loamy or clayey subsoil within a depth of 20 inches. Pedro and Seaboard soils have limestone bedrock within a depth of 20 inches. Bushnell soils have limestone bedrock within a depth of 40 inches.

The seasonal high water table is perched at a depth of 48 to 72 inches in the Shadeville soil for 1 to 3 months during most years. It is perched at a depth of 42 to 72 inches in the Otela soil for 1 to 3 months during most years. Permeability is slow in the Shadeville soil and slow or moderately slow in the Otela soil. Available water capacity is low in both soils.

Most areas of this map unit are used as pasture or cropland. Other areas are used for residential development or the production of pine trees. Natural vegetation consists mainly of live oak, laurel oak, magnolia, slash pine, and longleaf pine in the overstory and blackberry, pineland threeawn, greenbrier, American beautyberry, brackenfern, bluestems, and scattered saw palmetto and cabbage-palm in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are moderately suited to cultivated crops. Droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

These soils are well suited to pasture. Seasonal droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is high. The main management concerns are seedling mortality caused by the seasonal droughtiness and the low fertility; the equipment limitation caused by the loose, sandy surface layer; and, in some areas, plant competition. Planting adapted trees, such as slash pine, and planting during the wetter months reduce the seedling mortality rate. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

These soils have only slight limitations affecting sites for residential and commercial buildings and local roads and streets. Wetness, the restricted permeability in the subsoil, and the bedrock are moderate limitations on sites for septic tank absorption fields. Installing an oversized septic tank absorption field and taking care not to cluster homes and septic systems can help to overcome these limitations and minimize the hazard of ground-water pollution. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations. Applications of mulch, applications of fertilizer, and irrigation generally are needed to establish turf grasses.

The capability subclass is IIs for the Shadeville soil and IIIs for the Otela soil. The woodland ordination symbol is 11S for the Shadeville soil and 10S for the Otela soil.

15—Holopaw-Pineda complex, frequently flooded. These poorly drained, very deep, nearly level soils are on flood plains along rivers and creeks. They are frequently flooded. Individual areas are generally elongated and range from 3 to nearly 300 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Holopaw soil is very dark gray fine sand about 3 inches thick. The subsurface layer is light brownish gray fine sand to a depth of about 50 inches and pale brown fine sand to a depth of 60 inches. The subsoil is gray sandy clay loam to a depth of 80 inches or more.

Typically, the surface layer of the Pineda soil is black fine sand about 4 inches thick. The upper part of the subsoil is brown fine sand to a depth of about 14 inches. The underlying material is light gray fine sand to a depth of about 28 inches and white fine sand to a depth of 35 inches. The lower part of the subsoil is light gray fine sandy loam to a depth of about 52 inches. The underlying material is gray fine sand to a depth of 80 inches or more.

Generally, the mapped areas average about 55

percent Holopaw and similar soils and 29 percent Pineda and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Holopaw and Pineda soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as Holopaw-Pineda complex, frequently flooded, Holopaw, Pineda, and similar soils make up about 76 to 93 percent of the mapped areas. Dissimilar soils make up about 7 to 24 percent. On 20 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Holopaw soil but do not have a loamy subsoil within a depth of 80 inches, have a dark surface layer that is more than 7 inches thick, or have a subsurface layer that has colors in shades of yellowish brown. Also included are soils that are similar to the Pineda soil but do not have a sandy subsoil that is more than 4 inches thick, do not have sandy pockets and intrusions in the upper 2 to 10 inches of the loamy subsoil, or have a dark surface layer that is more than 10 inches thick. Also included are soils that are similar to the Pineda and Holopaw soils but have bedrock or layers of shell fragments below a depth of 60 to 80 inches or have a surface layer of muck, loamy sand, or sandy loam that is more than 3 inches thick.

Dissimilar soils that are included with the Holopaw and Pineda soils in mapping occur as small areas of Albany, Bradenton, Chobee, Gator, Ousley, and Terra Ceia soils and soils that have limestone bedrock within a depth of 60 inches. Bradenton and Chobee soils are in positions on the landscape similar to those of the Holopaw and Pineda soils. Albany and Ousley soils are in the slightly higher landscape positions. Gator and Terra Ceia soils are in the lower landscape positions. Bradenton soils have a loamy subsoil within a depth of 20 inches. Chobee soils are loamy throughout.

In most years the seasonal high water table is within a depth of 12 inches in the Holopaw and Pineda soils for 2 to 6 months, but it can recede to a depth of about 60 inches during droughty periods. Areas of this map unit are flooded by adjacent rivers or creeks for periods of 1 to 4 months during most years. Permeability is moderate in the Holopaw soil and slow or very slow in the Pineda soil. Available water capacity is low in both soils.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Some small areas are used for the production of pine trees. Natural vegetation consists mainly of laurel oak, water oak, sweetgum, red maple, slash pine, longleaf pine, basswood, and scattered baldcypress in the overstory and cabbage-palm, longleaf uniola, low panicums, and scattered saw palmetto in the understory. This map unit generally is in the Bottomland Hardwoods ecological community *(24)*.

These soils are not suited to and generally are not used for cropland. Limitations, including flooding and wetness, are impractical to overcome under normal circumstances.

These soils are poorly suited to pasture. The flooding, the wetness, and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Native forage species grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness and the flooding. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The flooding and the wetness are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the installation of levees and drainage systems, are necessary to overcome these limitations.

The capability subclass is VIw for the Holopaw soil and Vw for the Pineda soil. The woodland ordination symbol is 10W for both soils.

16—Chobee-Gator complex, frequently flooded. These very poorly drained, very deep, nearly level soils are on flood plains. They are frequently flooded.

Individual areas are generally elongated and range from 4 to nearly 2,900 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer of the Chobee soil is dark brown muck to a depth of about 3 inches and very dark gray fine sandy loam to a depth of 19 inches. The subsoil, to a depth of about 42 inches, is dark gray sandy clay loam. The underlying material to a depth of 80 inches or more is gray loamy fine sand.

Typically, the surface layer of the Gator soil is black muck about 26 inches thick. The underlying material is very dark gray fine sandy loam to a depth of about 40 inches, gray sandy clay loam to a depth of 52 inches, and light gray fine sand to a depth of 80 inches or more.

On 80 percent of the acreage mapped as Chobee-Gator complex, frequently flooded, Chobee, Gator, and similar soils make up about 77 to 100 percent of the mapped areas. Dissimilar soils make up less than about 23 percent. On 20 percent of the acreage, the dissimilar soils make up more than 23 percent of the mapped areas. Generally, the mapped areas average about 45 percent Chobee and similar soils and 43 percent Gator and similar soils.

Included in mapping are soils that are similar to the Chobee soil but have a sandy substratum at a depth of 20 to 40 inches, have a dark surface layer that is less than 10 inches thick, have an organic surface layer that is 4 to 16 inches thick, have a surface layer of loamy fine sand or sandy clay loam that is 4 to 20 inches thick, or have bedrock between depths of 40 and 80 inches. Also included are soils that are similar to the Gator soil but have a sandy layer that is more than 12 inches thick and underlies the organic surface layer, have an organic surface layer that is more than 51 inches thick, or have bedrock between depths of 40 and 80 inches.

Dissimilar soils that are included with the Chobee and Gator soils in mapping occur as small areas of Bradenton, Hicoria, Holopaw, Myakka, Pineda, Placid, Pompano, and Popash soils and soils that have bedrock between depths of 20 and 40 inches. Hicoria, Placid, and Popash soils are in positions on the landscape similar to those of the Chobee and Gator soils. Bradenton, Holopaw, Myakka, Pineda, and Pompano soils are in the slightly higher landscape positions. Hicoria, Placid, and Popash soils are sandy to a depth of 20 inches or more.

The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Chobee and Gator soils and of the similar soils are fairly consistent in most mapped areas.

Throughout the year the seasonal high water table is within a depth of 6 inches in the Chobee and Gator soils. Areas of this map unit are flooded by adjacent rivers or creeks for periods of 1 to 6 months during most years. Permeability is slow or very slow in the Chobee soil and moderate in the Gator soil. Available water capacity is moderate in the Chobee soil and very high in the Gator soil.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of cypress, red maple, sweetbay, sweetgum, and Florida willow in the overstory and pickerelweed, lizard's-tail, water iris, and scattered cabbage-palm in the understory. This map unit generally is in the Swamp Hardwoods or Cypress Swamp ecological community *(24)*.

These soils are not suited to and generally are not used for cropland, pasture, or the production of pine trees. Limitations, including flooding and wetness, are impractical to overcome under normal circumstances.

The flooding and the wetness are severe limitations affecting sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the installation of levees and drainage systems and the addition of large amounts of fill, are necessary to overcome these limitations.

The capability subclass is Vw for the Chobee soil and VIIw for the Gator soil. The woodland ordination symbol is 6W for both soils.

17—Adamsville fine sand, 0 to 5 percent slopes. This somewhat poorly drained, very deep, nearly level to gently sloping soil is on low ridges and knolls on or adjacent to flatwoods. Individual areas are generally irregular in shape, and range from 2 to nearly 1,000 acres in size.

Typically, the surface layer is very dark gray fine sand to a depth of about 6 inches and dark gray fine sand to a depth of 14 inches. The underlying material is fine sand. It is grayish brown to a depth of about 32 inches, pale brown to a depth of 43 inches, light gray to a depth of 70 inches, and white to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Adamsville fine sand, 0 to 5 percent slopes, Adamsville and similar soils make up about 79 to 88 percent of the mapped areas. Dissimilar soils make up about 12 to 21 percent. On 5 percent of the acreage, the dissimilar soils make up more than 21 percent of the mapped areas.

Included in mapping are soils that are similar to the Adamsville soil but have a light-colored subsurface layer that overlies a brown or yellow subsoil; have a dark, organically coated subsoil; have a loamy subsoil or limestone bedrock below a depth of 40 inches; or

have a dark surface layer that is more than 10 inches thick.

Dissimilar soils that are included with the Adamsville soil in mapping are small areas of Hicoria, Immokalee, Millhopper, Myakka, Orsino, Placid, Pomona, Pompano, Popash, Smyrna, Tavares, and Wauchula soils and soils that have limestone bedrock within a depth of 60 inches. Millhopper, Orsino, and Tavares soils are in the higher landscape positions. Immokalee, Myakka, Pomona, Pompano, Smyrna, and Wauchula soils are in the slightly lower landscape positions. Hicoria, Placid, and Popash soils are in depressions.

In most years the seasonal high water table is at a depth of 24 to 42 inches in the Adamsville soil for 2 to 6 months. It is at a depth of 12 to 24 inches for 1 to 2 weeks following heavy rains. Permeability is rapid. Available water capacity is low.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture, cropland, or wildlife habitat. Natural vegetation consists mainly of live oak, laurel oak, slash pine, and longleaf pine in the overstory and pineland threeawn, saw palmetto, gallberry, blackberry, bluestems, running oak, and reindeer moss in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

This soil is poorly suited to cultivated crops. The main management concerns are seasonal wetness, which can delay planting; seasonal droughtiness caused by the low available water capacity; and low natural fertility. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. A well designed sprinkler irrigation system can help to maintain optimum soil moisture in the root zone during droughty periods. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth. Green manure crops, including grasses and legumes, should be used in the crop rotation.

This soil is moderately suited to pasture. The main management concerns are low natural fertility and seasonal droughtiness caused by the low available water capacity in the root zone. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation and plant competition caused by the seasonal wetness and the seedling mortality caused by the low available water capacity in the root zone and the low fertility. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Site preparation should include removing the larger debris to facilitate mechanical operations and chopping the woody understory vegetation to reduce immediate plant competition. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

The wetness is a moderate limitation affecting sites for residential and commercial buildings and local roads and streets. Installing a subsurface drainage system around the foundations of buildings and installing shallow ditches along roadsides can help to overcome this limitation. The wetness is a severe limitation on sites for septic tank absorption fields. Installing a filtering mound of suitable soil material can help to overcome this limitation. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic can help to overcome these limitations.

The capability subclass is IIIw. The woodland ordination symbol is 10W.

18—Wauchula fine sand. This poorly drained, very deep, nearly level soil is on flatwoods. Individual areas are generally irregular in shape and range from 13 to nearly 800 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of about 18 inches, is light gray fine sand. The subsoil is very dark brown, organically coated fine sand to a depth of about 27 inches; light yellowish brown fine sand to a depth of 32 inches; light brownish gray sandy clay loam to a depth of 47 inches; light gray sandy clay loam to a depth of 61 inches; and gray loamy fine sand to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Wauchula fine sand, Wauchula and similar soils make up about 79 to 100 percent of the mapped areas. Dissimilar soils make up less than 21 percent. On 5 percent of the acreage, the dissimilar soils make up more than 21 percent of the mapped areas.

Included in mapping are soils that are similar to the Wauchula soil but do not have an organically coated

subsoil within a depth of 30 inches, have a loamy subsoil at a depth of 40 to 80 inches, do not have a subsurface layer, have a dark surface horizon that is more than 8 inches thick, or have bedrock or layers of shell fragments below a depth of 60 inches.

Dissimilar soils that are included with the Wauchula soil in mapping occur as small areas of Adamsville, Boca, Bradenton, Cassia, Hicoria, Immokalee, Janney, Myakka, Placid, Pomello, Pompano, Popash, Smyrna, Sparr, and Zolfo soils and soils that have bedrock within a depth of 60 inches. Boca, Bradenton, Immokalee, Janney, Myakka, Pompano, and Smyrna soils are in positions on the landscape similar to those of the Wauchula soil. Adamsville, Cassia, Pomello, Sparr, and Zolfo soils are in the slightly higher landscape positions. Hicoria, Placid, and Popash soils are in depressions. Boca, Bradenton, and Pompano soils do not have an organically stained subsoil. Janney and Boca soils have limestone bedrock within a depth of 40 inches. Immokalee, Myakka, and Smyrna soils are sandy to a depth of 80 inches or more.

In most years the seasonal high water table is at a depth of 6 to 18 inches in the Wauchula soil for 1 to 4 months, but it can recede to a depth of about 60 inches during droughty periods. Permeability is slow. Available water capacity is moderate.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture, cropland, or wildlife habitat. Natural vegetation consists mainly of slash pine and longleaf pine in the overstory and saw palmetto, pineland threeawn, waxmyrtle, fetterbush, gallberry, and bluestems in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

This soil is poorly suited to cultivated crops. Wetness during the growing season, occasional droughtiness, and low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during the growing season. Bedding is necessary for most row crops. A well designed sprinkler irrigation system can help to maintain optimum soil moisture during droughty periods. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

This soil is moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods or extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IIIw. The woodland ordination symbol is 10W.

19—Sparr fine sand. This somewhat poorly drained, very deep, nearly level soil is on low knolls and ridges on flatwoods. Individual areas are generally irregular in shape and range from 3 to nearly 1,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 6 inches thick. The subsurface layer is grayish brown fine sand to a depth of about 18 inches, light gray fine sand to a depth of 30 inches, and white fine sand to a depth of 54 inches. The subsoil is light gray sandy clay loam to a depth of 80 inches or more.

On 80 percent of the acreage mapped as Sparr fine

sand, Sparr and similar soils make up about 75 to 94 percent of the mapped areas. Dissimilar soils make up about 6 to 25 percent. On 20 percent of the acreage, the dissimilar soils make up more than 25 percent of the mapped areas.

Included in mapping are soils that are similar to the Sparr soil but do not have a loamy subsoil within a depth of 80 inches; have a dark, organically stained layer that overlies the subsoil; have sandy materials underlying the subsoil; or have a dark surface layer that is more than 10 inches thick.

Dissimilar soils that are included with the Sparr soil occur as small areas of Hicoria, Holopaw, Immokalee, Lochloosa, Millhopper, Myakka, Orsino, Placid, Pompano, Popash, and Tavares soils. Holopaw, Immokalee, Myakka, and Pompano soils are in the slightly lower landscape positions. Lochloosa soils are in positions on the landscape similar to those of the Sparr soil. Millhopper, Orsino, and Tavares soils are in the slightly higher landscape positions. Hicoria, Placid, and Popash soils are in depressions. Lochloosa soils have a loamy subsoil within a depth of 40 inches.

In most years the seasonal high water table is at a depth of 18 to 42 inches in the Sparr soil for 1 to 4 months, but it is between depths of 12 and 18 inches for 1 to 2 weeks following heavy rains. Permeability is slow or moderately slow. Available water capacity is low.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture, cropland, or wildlife habitat. Natural vegetation consists mainly of live oak, laurel oak, slash pine, and longleaf pine in the overstory and pineland threeawn, saw palmetto, gallberry, blackberry, bluestems, running oak, and reindeer moss in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

This soil is poorly suited to cultivated crops. The main management concerns are seasonal wetness, which can delay planting; seasonal droughtiness, which is caused by the low available water capacity; and low natural fertility. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. A well designed sprinkler irrigation system can help to maintain optimum soil moisture in the root zone during droughty periods. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth. Green manure crops, including grasses and legumes, should be used in the crop rotation.

This soil is moderately suited to pasture. The main management concerns are the low natural fertility and the seasonal droughtiness caused by the low available water capacity in the root zone. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation and plant competition caused by the seasonal wetness and the seedling mortality caused by the low available water capacity in the root zone and the low fertility. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Site preparation should include removing the larger debris to facilitate mechanical operations and chopping the woody understory vegetation to reduce immediate plant competition. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

This soil has moderate limitations affecting sites for residential and commercial buildings and local roads and streets mainly because of wetness. Installing a subsurface drainage system around the foundations of buildings and installing shallow ditches along roadsides can help to overcome these limitations. The wetness is a severe limitation on sites for septic tank absorption fields. Installing a filtering mound of suitable soil material generally can overcome this limitation. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic can help to overcome these limitations.

The capability subclass is IIIw. The woodland ordination symbol is 10W.

21—Pompano fine sand. This poorly drained, very deep, nearly level soil is on sloughs and slightly elevated knolls on flatwoods. Individual areas are generally irregular in shape and range from 2 to nearly 500 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark grayish brown fine sand about 7 inches thick. The underlying material is fine sand. It is brown to a depth of about 13 inches, pale brown to a depth of 38 inches, light gray to a depth of 66 inches, and very pale brown to a depth of 80 inches or more.

On 80 percent of the acreage mapped as Pompano fine sand, Pompano and similar soils make up about 76 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 24 percent. On 20 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Pompano soil but have a seasonal high water table at a depth of 12 to 20 inches; have a loamy subsoil at a depth of 40 to 80 inches; have a dark, organically coated subsoil or a subsoil that has colors in shades of yellowish brown or brownish yellow; have bedrock at a depth of 60 to 80 inches; or have a dark surface layer that is more than 6 inches thick.

Dissimilar soils that are included with the Pompano soil in mapping occur as small areas of Adamsville, Boca, Pineda, Placid, Popash, Sparr, Wauchula, and Zolfo soils and soils that have bedrock at a depth of 40 to 60 inches. Adamsville, Sparr, and Zolfo soils are in the slightly higher landscape positions. Boca, Pineda, and Wauchula soils are in positions on the landscape similar to those of the Pompano soil. Placid and Popash soils are in depressions. Boca, Pineda, and Wauchula soils have a loamy subsoil within a depth of 40 inches. Boca soils have limestone bedrock within a depth of 40 inches.

In most years the seasonal high water table is within a depth of 6 inches in the Pompano soil for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is rapid. Available water capacity is very low.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture or wildlife habitat. Natural vegetation consists mainly of slash pine in the overstory and pineland threeawn, waxmyrtle, gallberry, fetterbush, bluestems, and scattered saw palmetto and cabbage-palm in the understory. This map unit generally is in the North Florida Flatwoods or Slough ecological community *(24)*.

This soil is poorly suited to cultivated crops. Wetness during the growing season and low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Bedding is necessary for most row crops. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

This soil is moderately suited to pasture. The main management concerns are the wetness and the low fertility. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw. The woodland ordination symbol is 8W.

22—Holopaw fine sand. This poorly drained, very deep, nearly level soil is on sloughs on flatwoods and on broad, low flats. Individual areas are generally irregular in shape and range from 3 to nearly 600 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 3 inches thick. The subsurface layer is dark gray fine sand to a depth of about 17 inches, grayish brown fine sand to a depth of 35 inches, and brown fine sand to a depth of 54 inches. The subsoil is grayish

brown fine sandy loam to a depth of about 62 inches and gray sandy clay loam to a depth of 80 inches or more.

On 80 percent of the acreage mapped as Holopaw fine sand, Holopaw and similar soils make up about 76 to 100 percent of the mapped areas. Dissimilar soils make up less than 24 percent. On 20 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Holopaw soil but have a dark, organically coated layer that overlies the subsoil; have a yellowish brown or brownish yellow subsurface layer; have a dark surface layer that is more than 7 inches thick; or do not have a loamy subsoil.

Dissimilar soils that are included with the Holopaw soil in mapping occur as small areas of Adamsville, Bivans, Ft. Green, Hicoria, Lochloosa, Lutterloh, Pineda, Placid, Popash, Sparr, and Wauchula soils. Hicoria, Pineda, and Wauchula soils are in positions on the landscape similar to those of the Holopaw soil. Adamsville, Bivans, Ft. Green, Lochloosa, Lutterloh, and Sparr soils are in the slightly higher landscape positions. Hicoria, Placid, and Popash soils are in depressions. Hicoria, Pineda, and Wauchula soils have a loamy subsoil within a depth of 40 inches. Wauchula soils have an organically stained subsoil.

In most years the seasonal high water table is within a depth of 12 inches in the Holopaw soil for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is moderately slow or moderate. Available water capacity is low.

Most areas of this map unit are used for pasture or the production of pine trees. Natural vegetation consists mainly of scattered slash pine and longleaf pine in the overstory and waxmyrtle, bluestems, maidencane, sand cordgrass, hatpin, pineland threeawn, low panicums, and scattered saw palmetto and cabbage-palm in the understory. This map unit generally is in the Slough ecological community *(24)*.

This soil is poorly suited to cultivated crops. Wetness during the growing season and low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Bedding is necessary for most row crops. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

This soil is moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw. The woodland ordination symbol is 10W.

23—Zolfo sand. This somewhat poorly drained, very deep, nearly level soil is on low ridges and knolls on

flatwoods. Individual areas are generally irregular in shape and range from 3 to nearly 300 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray sand about 4 inches thick. The subsurface layer is pale brown sand to a depth of about 8 inches, gray sand to a depth of 32 inches, light gray sand to a depth of 50 inches, pale brown sand to a depth of 65 inches, and light brownish gray sand to a depth of 71 inches. The subsoil is very dark grayish brown, organically coated sand to a depth of 80 inches or more.

On 80 percent of the acreage mapped as Zolfo sand, Zolfo and similar soils make up about 78 to 96 percent of the mapped areas. Dissimilar soils make up about 4 to 22 percent. On 20 percent of the acreage, the dissimilar soils make up more than 22 percent of the mapped areas.

Included in mapping are soils that are similar to the Zolfo soil but do not have an organically coated subsoil within a depth of 80 inches, have an organically coated subsoil within a depth of 50 inches, have a surface layer of fine sand, have a loamy subsoil at a depth of 40 to 80 inches, or have bedrock at a depth of 60 to 80 inches.

Dissimilar soils that are included with the Zolfo soil in mapping occur as small areas of Holopaw, Immokalee, Myakka, Orsino, Placid, Pomona, Pompano, Popash, and Smyrna soils and soils that have bedrock within a depth of 60 inches. Holopaw, Immokalee, Myakka, Pomona, Pompano, and Smyrna soils are in the slightly lower landscape positions. Orsino soils are in the slightly higher landscape positions. Placid and Popash soils are in depressions.

In most years the seasonal high water table is at a depth of 24 to 42 inches in the Zolfo soil for 2 to 6 months. It is at a depth of 12 to 24 inches for 1 to 2 weeks following heavy rains. Permeability is moderate. Available water capacity is low.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture, cropland, or wildlife habitat. Natural vegetation consists mainly of slash pine, longleaf pine, live oak, laurel oak, and scattered small turkey oak in the overstory and pineland threeawn, saw palmetto, gallberry, blackberry, bluestems, running oak, and reindeer moss in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

This soil is poorly suited to cultivated crops. The main management concerns are seasonal wetness, which can delay planting; seasonal droughtiness, which is caused by the low available water capacity; and low natural fertility. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. A well designed sprinkler irrigation system can help to maintain optimum soil moisture in the root zone during droughty periods. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth. Green manure crops, including grasses and legumes, should be used in the crop rotation.

This soil is moderately suited to pasture. The main management concerns are the seasonal droughtiness caused by the low available water capacity in the root zone and the low natural fertility. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation and plant competition caused by the seasonal wetness and seedling mortality caused by the low available water capacity in the root zone and the low fertility. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Site preparation should include removing the larger debris to facilitate mechanical operations and chopping the woody understory vegetation to reduce immediate plant competition. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

This soil has moderate limitations affecting sites for residential and commercial buildings and local roads and streets mainly because of the wetness. Installing a subsurface drainage system around the foundations of buildings and installing shallow ditches along roadsides can help to overcome these limitations. The wetness is a severe limitation on sites for septic tank absorption fields. Installing a filtering mound of suitable soil material generally can overcome this limitation. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic can help to overcome these limitations.

The capability subclass is IIIw. The woodland ordination symbol is 10W.

24—Terra Ceia muck, depressional. This very poorly drained, very deep, nearly level soil is in depressions on flatwoods. It is ponded. Individual areas are generally irregular in shape and range from 15 to nearly 200 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is muck. It is black to a depth of about 6 inches and very dark brown to a depth of 59 inches. The underlying material is white fine sand to a depth of 80 inches or more.

On 80 percent of the acreage mapped as Terra Ceia muck, depressional, Terra Ceia and similar soils make up about 81 to 100 percent of the mapped areas. Dissimilar soils make up less than 19 percent. On 20 percent of the acreage, the dissimilar soils make up more than 19 percent of the mapped areas.

Included in mapping are soils that are similar to the Terra Ceia soil but have an organic surface layer that is 16 to 51 inches thick or have bedrock at a depth of 40 to 60 inches.

Dissimilar soils that are included with the Terra Ceia soil in mapping occur as small areas of Chobee, Hicoria, Holopaw, Immokalee, Myakka, Placid, Pompano, and Popash soils and soils that have bedrock within a depth of 40 inches. Chobee, Hicoria, Placid, and Popash soils are in positions on the landscape similar to those of the Terra Ceia soil. Holopaw, Immokalee, Myakka, and Pompano soils are in the slightly higher landscape positions. Chobee, Hicoria, Placid, and Popash soils do not have a thick organic surface layer.

In most years the seasonal high water table is above the surface in the Terra Ceia soil for more than 6 months and is within 12 inches of the surface during the rest of the year. Permeability is rapid. Available water capacity is very high.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of cypress, red maple, sweetbay, sweetgum, and Florida willow in the overstory and pickerelweed, lizard's-tail, water iris, and scattered cabbage-palm in the understory. Some areas do not have a woody overstory and support thick stands of sawgrass. This map unit generally is in the Swamp Hardwood, Cypress Swamp, or Sawgrass Marsh ecological community *(24)*.

This soil is not suited to and generally is not used for cropland, pasture, or the production of pine trees. Limitations, including ponding, are impractical to overcome under normal circumstances.

The ponding and subsidence of the organic layers are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the removal of the organic surface layer, the addition of large amounts of fill, and the installation of drainage systems, are necessary to overcome the limitations.

The capability subclass is VIIw. The woodland ordination symbol is 6W.

25—Pits and Dumps. This map unit consists of pits from which sandy or loamy soil material or limestone has been excavated and dumps in which the excavated materials have been piled. Also included in this map unit are sanitary landfill areas that have been excavated and backfilled with refuse materials and covered with soil material. Most of these areas are on the Chiefland and Williston Limestone Plains and the Brooksville Ridge. Individual areas are generally angular and range from 3 to nearly 300 acres in size.

Excavated pits vary in depth from 2 to more than 40 feet. Bedrock or loamy soil materials generally form the base of the pits. The pits commonly contain small areas of water. Piles of dumped materials are generally within or adjacent to the pits and range from 2 to more than 30 feet in height. They normally consist of sandy and loamy soil materials, limestone, or some heterogeneous mixture of these materials.

The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. Also, some areas are actively mined and the individual components are subject to redistribution.

Most excavated areas are on flatwoods or the coastal limestone shelf and are thickly vegetated with hydrophytic plants, such as cattail, sawgrass, maidencane, and primrose willow. Other areas are almost bare or are very sparsely vegetated. Most areas have not been reshaped or reclaimed. Pits and dumps have little or no value or potential for farming, the production of pine trees, or urban uses. They do, however, have some potential for wildlife habitat and for esthetic value if they are reshaped and revegetated to conform with the natural landscape. Many areas contain small ponds that have a high potential for fish production if they are stocked and properly managed.

No capability subclass or woodland ordination symbol is assigned.

26—Gator and Terra Ceia soils, frequently flooded. These very poorly drained, very deep, nearly level soils are on flood plains along rivers and creeks. They are frequently flooded. Individual areas are generally elongated and range from 2 to nearly 4,000 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer of the Gator soil is very dark brown muck about 38 inches thick. The underlying

material is gray fine sandy loam to a depth of 80 inches or more.

Typically, the surface layer of the Terra Ceia soil is a mixture of black and very dark grayish brown muck to a depth of about 37 inches and black muck to a depth of 80 inches or more.

Some areas of the map unit are made up of Gator and similar soils, some are made up of Terra Ceia and similar soils, and some are made up of both soils. The relative proportion of the combinations of the soils varies. Areas of the individual soils are large enough to map separately, but because of present and predicted use they were mapped as one unit.

On 80 percent of the acreage mapped as Gator and Terra Ceia soils, frequently flooded, Gator, Terra Ceia, and similar soils make up about 76 to 100 percent of the mapped areas. Dissimilar soils make up less than 24 percent. On 20 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Gator soil but have a sandy layer that is more than 12 inches thick underlying the organic surface layer or have an organic surface layer that is less than 16 inches thick. Also included are soils that are similar to the Gator and Terra Ceia soils but have bedrock below a depth of 40 inches or are extremely acid in the surface layer.

Dissimilar soils that are included with the Gator and Terra Ceia soils in mapping occur as small areas of Bradenton, Chobee, Hicoria, Holopaw, Pineda, Placid, and Popash soils and soils that have bedrock within a depth of 40 inches. Hicoria, Placid, and Popash soils are in positions on the landscape similar to those of the Gator and Terra Ceia soils. Bradenton, Chobee, Holopaw, and Pineda soils are in the slightly higher landscape positions. Hicoria, Placid, and Popash soils are sandy to a depth of 20 inches or more and do not have a thick, organic surface layer.

Throughout the year the seasonal high water table is within a depth of 6 inches in the Gator and Terra Ceia soils. Areas of this map unit are flooded by adjacent rivers or creeks for periods of 1 to 6 months during most years. Permeability is moderate in the Gator soil and rapid in the Terra Ceia soil. Available water capacity is very high in both soils.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of cypress, red maple, sweetbay, sweetgum, and Florida willow in the overstory and pickerelweed, lizard's-tail, water iris, and scattered cabbage-palm in the understory. Some areas do not have a woody overstory and support thick stands of sawgrass. This map unit generally is in the Swamp Hardwoods, Cypress Swamp, or Sawgrass Marsh ecological community *(24)*.

These soils are not suited to and generally are not used for cropland, pasture, or the production of pine trees. Limitations, including flooding and wetness, are impractical to overcome under normal circumstances.

The flooding, the wetness, and subsidence of the organic layers are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the removal of the organic surface layer, the addition of large amounts of fill, and the installation of levees and drainage systems, are necessary to overcome these limitations.

The capability subclass is VIIw. The woodland ordination symbol is 6W.

27—Placid and Popash soils, depressional. These very poorly drained, very deep, nearly level soils are in depressions on flatwoods or on low flats. They are ponded. Individual areas are generally oval or irregular in shape and range from 2 to nearly 800 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer of the Placid soil is black fine sand about 22 inches thick. The underlying material is dark gray fine sand to a depth of about 38 inches and light brownish gray fine sand to a depth of 80 inches or more.

Typically, the surface layer of the Popash soil is very dark gray fine sand about 12 inches thick. The subsurface layer is a mixture of dark grayish brown and grayish brown fine sand to a depth of about 20 inches, grayish brown fine sand to a depth of 30 inches, and light brownish gray fine sand to a depth of 45 inches. The subsoil is dark gray sandy clay loam to a depth of 80 inches or more.

Some areas of the map unit are made up of Placid and similar soils, some are made up of Popash and similar soils, and some are made up of both soils. The relative proportion of the combinations of the soils varies. In many places areas of the individual soils are large enough to map separately, but because of present and predicted use they were mapped as one unit.

On most of the acreage mapped as Placid and Popash soils, depressional, Placid, Popash, and similar soils make up more than 90 percent of the mapped areas. Dissimilar soils make up less than 10 percent.

Included in mapping are soils that are similar to the Popash soil but have a loamy subsoil at a depth of 20 to 40 inches or have a clayey subsoil. Also included are soils that are similar to the Placid and Popash soils but have a surface layer that is less than 10 inches thick; have a dark surface layer that is more than 24 inches

Figure 7.—Ponding in an area of Placid and Popash soils, depressional. Such areas may remain dry for several years but can fill with water during very wet periods.

thick; have a surface layer of loamy fine sand, mucky fine sand, or mucky loamy fine sand that is more than 3 inches thick; have a layer of muck at the surface that is 4 to 16 inches thick; or have bedrock at a depth of 40 to 80 inches.

Dissimilar soils that are included with the Placid and Popash soils in mapping occur as small areas of Gator, Holopaw, Immokalee, Myakka, Pomona, Pompano, Samsula, and Terra Ceia soils and soils that have limestone at a depth of 20 to 40 inches. Gator, Samsula, and Terra Ceia soils are in positions on the landscape similar to those of the Placid and Popash soils. Holopaw, Immokalee, Myakka, Pomona, and Pompano soils are in the slightly higher landscape positions. Gator, Samsula, and Terra Ceia soils have an organic surface layer that is more than 16 inches thick.

The seasonal high water table is above the surface (fig. 7) in the Placid and Popash soils for more than 6 months during most years and is within a depth of 12 inches during the rest of the year. Permeability is rapid in the Placid soil and slow or very slow in the Popash soil. Available water capacity is moderate in both soils.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Some areas are grazed by cattle. Natural vegetation consists mainly of sand cordgrass, maidencane, pickerelweed, arrowhead, and water lily. Many areas have an overstory of cypress, red maple, sweetbay, and Florida willow. This map unit generally is in the Freshwater Marsh and Ponds or Cypress Swamp ecological community *(24)*.

These soils are not suited to and generally are not used for cropland, pasture, or the production of pine trees. Limitations, including ponding, are impractical to overcome under normal circumstances.

The ponding is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational

facilities. Extensive renovation measures, including the addition of large amounts of fill and the installation of drainage systems, are necessary to overcome this limitation.

The capability subclass is VIIw. The woodland ordination symbol is 2W.

29—Chobee-Bradenton complex, frequently flooded. This map unit consists of a very poorly drained Chobee soil and a poorly drained Bradenton soil. These very deep, nearly level soils are on flood plains. They are frequently flooded. Individual areas are generally elongated and range from 10 to nearly 1,300 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Chobee soil is black fine sandy loam to a depth of about 7 inches and very dark gray fine sandy loam to a depth of 11 inches. The subsoil is dark gray sandy clay loam that has common pockets of soft calcium carbonate accumulations to a depth of about 37 inches and gray sandy clay loam to a depth of 48 inches. The underlying material is greenish gray fine sandy loam to a depth of about 72 inches and dark gray fine sand to a depth of 80 inches or more.

Typically, the surface layer of the Bradenton soil is black fine sand about 4 inches thick. The subsurface layer is light brownish gray fine sand to a depth of about 9 inches. The subsoil is dark grayish brown sandy clay loam to a depth of about 18 inches and grayish brown fine sandy loam to a depth of 28 inches. The underlying material is white, calcareous fine sandy loam to a depth of about 32 inches, grayish brown loamy fine sand to a depth of 48 inches, and light gray fine sand to a depth of 80 inches or more.

Generally, the mapped areas average about 53 percent Chobee and similar soils and 38 percent Bradenton and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Chobee and Bradenton soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as Chobee-Bradenton complex, frequently flooded, Chobee, Bradenton, and similar soils make up about 80 to 100 percent of the mapped areas. Dissimilar soils make up less than 20 percent. On 20 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Included in mapping are soils that are similar to the Chobee soil but have a surface layer of fine sand, loamy fine sand, or muck that is more than 3 inches thick; have a dark surface layer that is less than 10 inches thick; or contain an average of less than 18 percent clay between depths of 10 and 40 inches. Also included are soils that are similar to the Bradenton soil but contain more than 18 percent clay in the upper 20 inches of the subsoil; have a surface layer of loamy fine sand, fine sandy loam, or muck that is more than 3 inches thick; have a dark, organically stained layer that overlies the subsoil; or have a loamy subsoil at a depth of 20 to 40 inches or within a depth of 6 inches. Also included are soils that are similar to the Chobee and Bradenton soils but have bedrock at a depth of 60 to 80 inches.

Dissimilar soils that are included with the Chobee and Bradenton soils in mapping occur as small areas of Albany, Aripeka, Boca, Gator, Hicoria, Holopaw, Myakka, Pompano, Samsula, Waccasassa, and Wekiva soils and soils that have bedrock at a depth of 40 to 60 inches. Albany and Aripeka soils are in the slightly higher landscape positions. Boca, Holopaw, Myakka, Pompano, Waccasassa, and Wekiva soils are in positions on the landscape similar to those of the Chobee and Bradenton soils. Gator, Hicoria, and Samsula soils are in the lower landscape positions. Boca, Holopaw, Myakka, and Pompano soils are sandy to a depth of 20 inches or more. Myakka soils have an organically stained subsoil. Boca, Waccasassa, and Wekiva soils have limestone bedrock within a depth of 40 inches.

In most years the seasonal high water table is within a depth of 6 inches in the Chobee and Bradenton soils for 2 to 6 months, but it can recede to a depth of about 60 inches during droughty periods. Areas of this map unit are flooded by adjacent rivers or creeks for periods of 1 to 4 months during most years. Permeability is slow or very slow in the Chobee soil and moderate in the Bradenton soil. Available water capacity is moderate in the Chobee soil and low in the Bradenton soil.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of laurel oak, water oak, sweetgum, red maple, slash pine, loblolly pine, longleaf pine, basswood, and scattered baldcypress in the overstory and cabbage-palm, longleaf uniola, low panicums, and scattered saw palmetto in the understory. This map unit generally is in the Bottomland Hardwoods ecological community *(24)*.

These soils are not suited to and generally are not used for cropland. Limitations, including flooding and wetness, are impractical to overcome under normal circumstances.

These soils are poorly suited to pasture. The flooding and the wetness are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods.

Native forage species grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is high. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness and the flooding. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine or loblolly pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

The flooding and the wetness are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the installation of levees and drainage systems, are necessary to overcome these limitations.

The capability subclass is Vw. The woodland ordination symbol is 6W for the Chobee soil and 11W for the Bradenton soil.

31—Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes. This map unit consists of a well drained, moderately deep Jonesville soil; a moderately well drained, very deep Otela soil; and a moderately well drained, shallow or very shallow Seaboard soil. These nearly level to gently sloping soils are on karst uplands. Individual areas are generally irregular in shape and range from 5 to more than 10,000 acres in size.

Typically, the surface layer of the Jonesville soil is gray fine sand about 5 inches thick. The subsurface layer is pale brown fine sand to a depth of about 14 inches and very pale brown fine sand to a depth of 27 inches. The subsoil is brownish yellow sandy clay loam to a depth of about 35 inches. Limestone bedrock is at a depth of about 35 inches.

Typically, the surface layer of the Otela soil is grayish brown fine sand about 4 inches thick. The subsurface layer is light gray fine sand to a depth of about 22 inches, brownish yellow fine sand to a depth of 40 inches, very pale brown fine sand to a depth of 50 inches, and brownish yellow fine sand to a depth of 58 inches. The subsoil is yellowish brown sandy clay loam to a depth of 66 inches. Limestone bedrock is at a depth of about 66 inches.

Typically, the surface layer of the Seaboard soil is dark grayish brown fine sand about 8 inches thick. The underlying material is pale brown fine sand to a depth of about 17 inches. Limestone bedrock is at a depth of about 17 inches.

Generally, the mapped areas average about 48 percent Jonesville and similar soils, 25 percent Otela and similar soils, and 16 percent Seaboard and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Jonesville, Otela, and Seaboard soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes, Jonesville, Otela, Seaboard, and similar soils make up about 82 to 96 percent of the mapped areas. Dissimilar soils make up about 4 to 18 percent. On 5 percent of the acreage, the dissimilar soils make up more than 18 percent of the mapped areas.

Included in mapping are soils that are similar to the Jonesville soil but do not have a loamy subsoil or do not have bedrock within a depth of 40 inches. Also included are soils that are similar to the Otela soil but do not have a seasonal high water table within a depth of 72 inches, have a dark surface layer that is more than 10 inches thick, or have bedrock at a depth of 45 to 60 inches. Also included are soils that are similar to the Seaboard soil but have a loamy subsoil that overlies the bedrock, have a dark surface layer that overlies the bedrock or that is more than 10 inches thick, or have less than 5 percent silt and clay in the subsurface layer.

Dissimilar soils that are included with the Jonesville, Otela, and Seaboard soils in mapping occur as small areas of Bushnell, Candler, Levyville, Lutterloh, Mabel, Moriah, and Tavares soils; small areas of strongly sloping soils; and areas of rock outcrop on the edges of sinkholes. Bushnell, Candler, Levyville, Lutterloh, Mabel, Moriah, and Tavares soils are in positions on the landscape similar to those of the Jonesville, Otela, and Seaboard soils. Bushnell and Mabel soils have a clayey subsoil within a depth of 20 inches. They are somewhat

poorly drained. Candler and Tavares soils are sandy to a depth of 80 inches or more. Levyville soils have a loamy subsoil within a depth of 20 inches. Moriah and Lutterloh soils are somewhat poorly drained.

Throughout the year the seasonal high water table is below the bedrock in the Jonesville and Seaboard soils. It is perched at a depth of 42 to 72 inches for 1 to 4 months during most years in the Otela soil. Permeability is moderately slow or moderate in the Jonesville soil, moderate in the Otela soil, and rapid in the Seaboard soil. Available water capacity is very low in the Jonesville and Seaboard soils and low in the Otela soil.

Most areas of this map unit are used as pasture or cropland. Other areas are used for the production of pine trees or have been subdivided for residential development. Natural vegetation consists mainly of live oak, laurel oak, magnolia, loblolly pine, longleaf pine, slash pine, and eastern redcedar in the overstory and blackberry, pineland threeawn, greenbrier, American beautyberry, brackenfern, bluestems, and scattered saw palmetto and cabbage-palm in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are moderately suited to cultivated crops. Droughtiness, low natural fertility, soil blowing, and the shallowness to bedrock are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing. Special cultivation equipment may be needed because of the limited depth to bedrock.

These soils are well suited to pasture. The main management concerns are seasonal droughtiness, the thin root zone, and the low natural fertility. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are seedling mortality and windthrow, which are caused by the seasonal droughtiness and the shallowness to bedrock; the equipment limitation, which is caused by the shallowness to bedrock and the loose, sandy surface layer; and plant competition. Planting adapted trees, such as slash pine, and planting during the wetter months reduce the seedling mortality rate. Leaving some rows of unharvested, mature trees as windbreaks reduces the hazard of windthrow. Because of the shallowness to bedrock, specialized equipment may be needed for proper site preparation and tree planting activities. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

Jonesville and Seaboard soils have severe limitations on sites for septic tank absorption fields mainly because of wetness and depth to bedrock. Otela soils have moderate limitations on sites for septic tank absorption fields mainly because of the depth to bedrock, the wetness, and the moderate permeability in the subsoil. Careful site investigation is needed to locate suitably large areas that are deep enough over bedrock. Installing an oversized septic tank absorption field and avoiding the clustering of homes and septic systems can help to overcome the limitations and minimize the hazard of ground-water pollution. Jonesville and Otela soils have slight limitations on sites for residential and commercial buildings and local roads and streets, and Seaboard soils have moderate limitations. Areas of soils that are shallow or very shallow over bedrock are common throughout this map unit, but careful site investigation can usually locate suitably large areas that are deep enough over bedrock. Because of the shallowness to bedrock, specialized equipment may be needed for the installation of ditches or pipelines. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer and the shallow or very shallow bedrock. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations. Applications of mulch, applications of fertilizer and irrigation generally are needed to establish turf grasses.

The capability subclass is IIIs for the Jonesville and Otela soils and VIs for the Seaboard soil. The woodland ordination symbol is 10S for all three soils.

32—Otela-Tavares complex, 1 to 5 percent slopes. These moderately well drained, very deep, nearly level to gently sloping soils are on sandy karst uplands.

Individual areas are generally irregular in shape and range from 3 to nearly 5,000 acres in size.

Typically, the surface layer of the Otela soil is dark gray fine sand about 8 inches thick. The subsurface layer is grayish brown fine sand to a depth of about 18 inches, light brownish gray fine sand to a depth of 30 inches, very pale brown fine sand to a depth of 35 inches, white fine sand to a depth of 41 inches, and very pale brown fine sand to a depth of 68 inches. The subsoil is light yellowish brown fine sandy loam to a depth of about 78 inches and gray fine sandy loam to a depth of 80 inches or more.

Typically, the surface layer of the Tavares soil is dark grayish brown fine sand about 9 inches thick. The underlying material is fine sand. It is grayish brown to a depth of about 18 inches, pale brown to a depth of 38 inches, very pale brown to a depth of 48 inches, and white to a depth of 80 inches or more.

Generally, the mapped areas average about 50 percent Otela and similar soils and 41 percent Tavares and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Otela and Tavares soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as Otela-Tavares complex, 1 to 5 percent slopes, Otela, Tavares, and similar soils make up about 78 to 100 percent of the mapped areas. Dissimilar soils make up less than 22 percent. On 20 percent of the acreage, the dissimilar soils make up more than 22 percent of the mapped areas.

Included in mapping are soils that are similar to the Otela soil but have base saturation of less than 35 percent in the lower part of the subsoil, have bedrock at a depth of 45 to 60 inches, have a subsoil that is less than 6 inches thick, or do not have a subsoil overlying the bedrock. Also included are soils that are similar to the Otela and Tavares soils but have a dark surface layer that is more than 10 inches thick or do not have a seasonal high water table within a depth of 72 inches. Also included are soils that are similar to the Tavares soil but have more than 5 percent silt and clay between depths of 10 and 40 inches.

Dissimilar soils that are included with the Otela and Tavares soils in mapping occur as small areas of Bonneau, Bushnell, Hague, Jonesville, Levyville, Lutterloh, Mabel, Moriah, Pedro, Seaboard, and Shadeville soils. Bonneau, Bushnell, Hague, Jonesville, Levyville, Lutterloh, Mabel, Moriah, Pedro, Seaboard, and Shadeville soils are in positions on the landscape similar to those of the Otela and Tavares soils. Bonneau, Bushnell, Hague, Jonesville, Levyville, Mabel, and Moriah soils have a loamy or clayey subsoil within a depth of 40 inches. Bushnell, Lutterloh, Mabel, and Moriah soils are somewhat poorly drained. Pedro and Seaboard soils have limestone bedrock within a depth of 20 inches.

The seasonal high water table is at a depth of 48 to 72 inches in the Otela and Tavares soils for 1 to 4 months during most years. It is perched in the Otela soil. Permeability is slow or moderately slow in the Otela soil and rapid or very rapid in the Tavares soil. Available water capacity is low in the Otela soil and very low in the Tavares soil.

Most areas of this map unit are used as pasture or cropland. Other areas are used for the production of pine trees or have been subdivided for residential development. Natural vegetation consists mainly of live oak, laurel oak, bluejack oak, magnolia, loblolly pine, slash pine, and longleaf pine in the overstory and blackberry, pineland threeawn, greenbrier, American beautyberry, brackenfern, bluestems, and scattered saw palmetto and cabbage-palm in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are moderately suited to cultivated crops. Droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

These soils are well suited to pasture. Seasonal droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Pastures should be established or renovated during the wetter months. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are seedling mortality caused by the seasonal droughtiness and the low fertility; the equipment limitation caused by the loose, sandy surface layer; and, in some areas, plant competition. Planting adapted trees, such as slash

pine, and planting during the wetter months reduce the seedling mortality rate. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

These soils have only slight limitations affecting sites for residential and commercial buildings and local roads and streets. The seasonal wetness and the restricted permeability in the subsoil of the Otela soil are moderate limitations affecting septic tank absorption fields. Installing an oversized septic tank absorption field and taking care not to cluster homes and septic systems can help to overcome these limitations and minimize the hazard of ground-water pollution. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations. Applications of mulch, applications of fertilizer, and irrigation generally are needed to establish turf grasses.

The capability subclass is IIIs. The woodland ordination symbol is 10S.

33—Wulfert muck, frequently flooded. This very poorly drained, very deep, nearly level soil is in areas of tidal marsh. It is frequently flooded. Individual areas are generally irregular in shape and range from 3 to nearly 1,800 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is very dark brown muck about 30 inches thick. The underlying material is very dark gray mucky loamy fine sand to a depth of about 56 inches and very dark gray fine sand to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Wulfert muck, frequently flooded, Wulfert and similar soils make up about 99 to 100 percent of the mapped areas. Dissimilar soils make up less than 1 percent. On 5 percent of the acreage, the dissimilar soils make up more than 1 percent of the mapped areas.

Included in mapping are soils that are similar to the Wulfert soil but do not have an organic surface layer as much as 16 inches in thickness, have an organic surface layer that is more than 51 inches thick, have loamy materials underlying the organic surface layer, or have less than 0.75 percent total sulfur content in the upper 40 inches.

Dissimilar soils that are included with the Wulfert soil in mapping occur as small areas of Myakka soils in the slightly higher landscape positions.

The seasonal high water table is within a depth of 6 inches in the Wulfert soil throughout the year. Areas of this map unit are flooded by daily high tides. Permeability is rapid. Available water capacity is moderate.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of dense stands of black needlerush mixed with sawgrass. This map unit generally is in the Salt Marsh ecological community *(24)*.

This soil is not suited to and generally is not used for cropland, pasture, or the production of pine trees. Limitations, including flooding, salinity, and wetness, are impractical to overcome under normal circumstances.

The flooding, the wetness, and low strength are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the installation of levees and water-control systems and the addition of large amounts of fill, are necessary to overcome these limitations. If artificially drained or if used as fill material, this soil becomes extremely acid and thus can support only a limited variety of plants.

The capability subclass is VIIIw. No woodland ordination symbol is assigned.

34—Cassia-Pomello complex. These somewhat poorly drained, very deep, nearly level soils are on low knolls and ridges on flatwoods. Individual areas are generally oval or elongated and range from 2 to nearly 1,200 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Cassia soil is gray fine sand about 6 inches thick. The subsurface layer is light gray fine sand to a depth of about 24 inches. The subsoil is very dark brown, organically coated fine sand to a depth of about 30 inches; dark brown fine sand to a depth of 55 inches; brown fine sand to a depth of 70 inches; and very dark grayish brown, organically coated fine sand to a depth of 80 inches or more.

Typically, the surface layer of the Pomello soil is gray fine sand about 4 inches thick. The subsurface layer is light gray fine sand to a depth of about 35 inches and gray fine sand that has many very dark grayish brown and dark grayish brown, organically coated pockets to a depth of 40 inches. The subsoil is very dark brown, organically coated fine sand to a depth of about 46 inches and dark brown fine sand to a depth of 80 inches or more.

Generally, the mapped areas average about 55 percent Cassia and similar soils and 35 percent

Pomello and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Cassia and Pomello soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as Cassia-Pomello complex, Cassia, Pomello, and similar soils make up about 79 to 100 percent of the mapped areas. Dissimilar soils make up less than 21 percent. On 20 percent of the acreage, the dissimilar soils make up more than 21 percent of the mapped areas.

Included in mapping are soils that are similar to the Cassia and Pomello soils but have bedrock between depths of 60 and 80 inches, do not have an organically coated subsoil within a depth of 50 inches, or have a loamy subsoil at a depth of 40 to 80 inches.

Dissimilar soils that are included with the Cassia and Pomello soils in mapping occur as small areas of Immokalee, Myakka, Placid, Pompano, Popash, Orsino, Smyrna, and Tavares soils and soils that have bedrock at a depth of 20 to 60 inches. Orsino and Tavares soils are in the slightly higher landscape positions. Immokalee, Myakka, Pompano, and Smyrna soils are in the slightly lower landscape positions. Placid and Popash soils are in depressions.

The seasonal high water table is at a depth of 18 to 42 inches in the Cassia and Pomello soils for 2 to 6 months during most years. It can be at a depth of 12 to 20 inches for 1 to 2 weeks following heavy rains. Permeability is moderate or moderately rapid in the Cassia soil and moderately rapid in the Pomello soil. Available water capacity is low in the Cassia soil and moderate in the Pomello soil.

Most areas of this map unit are used for the production of pine trees. Other areas have been subdivided for residential development or support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of live oak, slash pine, and longleaf pine in the overstory and pineland threeawn, saw palmetto, gallberry, blackberry, bluestems, running oak, and reindeer moss in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

These soils are poorly suited to cultivated crops. The main management concerns are seasonal wetness, which may delay planting; seasonal droughtiness caused by the low or moderate available water capacity; and low natural fertility. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. A well designed sprinkler irrigation system can help to maintain optimum soil moisture in the root zone during droughty periods. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth. Green manure crops, including grasses and legumes, should be used in the crop rotation.

These soils are moderately suited to pasture. The main management concerns are seasonal droughtiness caused by the low or moderate available water capacity in the root zone and the low natural fertility. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are the equipment limitation and plant competition caused by the seasonal wetness and seedling mortality caused by the low or moderate available water capacity in the root zone and the low fertility. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Site preparation should include removing the larger debris to facilitate mechanical operations and chopping the woody understory vegetation to reduce immediate plant competition. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

Wetness is a moderate limitation affecting sites for residential and commercial buildings and local roads and streets. Installing a subsurface drainage system around the foundations of buildings and installing shallow ditches along roadsides can help to overcome this limitation. The wetness is a severe limitation on sites for septic tank absorption fields. Installing a filtering mound of suitable soil material can generally overcome this limitation. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic can help to overcome these limitations.

The capability subclass is VIs. The woodland ordination symbol is 8S.

35—Pineda fine sand, limestone substratum. This poorly drained, deep or very deep, nearly level soil is on low ridges and flatwoods on the coastal limestone shelf. Individual areas are generally irregular in shape

and range from 7 to nearly 1,100 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is black loamy fine sand about 3 inches thick. The subsurface layer is light gray fine sand to a depth of about 17 inches. The subsoil is pale brown fine sand to a depth of about 25 inches, gray sandy clay loam to a depth of 30 inches, and light gray fine sandy loam to a depth of 42 inches. The underlying material is light gray fine sand that has many light olive brown pockets of loamy fine sand. Limestone bedrock is at a depth of about 50 inches.

On 80 percent of the acreage mapped as Pineda fine sand, limestone substratum, Pineda and similar soils make up about 76 to 89 percent of the mapped areas. Dissimilar soils make up about 11 to 24 percent. On 20 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Pineda soil but have a dark, organically stained layer more than 2 inches thick that overlies the loamy subsoil; have bedrock or stone- to boulder-sized rock fragments at a depth of 20 to 40 inches; do not have bedrock within a depth of 80 inches; have a loamy subsoil at a depth of 40 to 80 inches; have sandy materials underlying the loamy subsoil within a depth of 40 inches; do not have sandy intrusions in the upper 2 to 10 inches of the subsoil; do not have a sandy subsoil; have a dark surface layer more than 10 inches thick; or have a surface layer of loamy fine sand that is more than 3 inches thick.

Dissimilar soils that are included with the Pineda soil in mapping occur as small areas of Bradenton, Chobee, Gator, Hicoria, Pompano, Popash, and Wekiva soils. Bradenton, Pompano, and Wekiva soils are in positions on the landscape similar to those of the Pineda soil. Chobee, Gator, Hicoria, and Popash soils are in the lower landscape positions. Bradenton and Wekiva soils have a loamy subsoil within a depth of 20 inches. Wekiva soils have limestone bedrock within a depth of 30 inches. Pompano soils are sandy to a depth of 80 inches or more.

In most years the seasonal high water table is within a depth of 12 inches in the Pineda soil for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is slow. Available water capacity is low.

Most areas of this map unit are used for the production of pine trees. Other areas are used for pasture or support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of slash pine, loblolly pine, and sweetgum in the overstory and bluestems, blackberry, poison ivy, hatpin, gallberry, waxmyrtle, fetterbush, maidencane, and scattered saw palmetto and cabbage-palm in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

This soil is poorly suited to cultivated crops. Wetness during the growing season and low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Bedding is necessary for most row crops. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

This soil is moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting

residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IIIw. The woodland ordination symbol is 10W.

37—Myakka mucky sand, occasionally flooded. This poorly drained, very deep, nearly level soil is on flatwoods that are adjacent to the tidal marsh or the flood plain of the Suwannee River. It is occasionally flooded. Individual areas are generally long and narrow and range from 3 to nearly 500 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is black muck to a depth of about 2 inches and very dark gray mucky sand to a depth of 10 inches. The subsurface layer is gray sand to a depth of about 21 inches. The subsoil is very dark gray sand to a depth of about 40 inches and very dark grayish brown sand to a depth of 80 inches or more.

On most of the acreage mapped as Myakka mucky sand, occasionally flooded, Myakka and similar soils make up more than 85 percent of the mapped areas. Dissimilar soils make up less than 15 percent.

Included in mapping are soils that are similar to the Myakka soil but have a surface layer of fine sand or sand that is more than 3 inches thick; have an organic layer at the surface that is more than 3 inches thick; do not have a dark, organically coated subsoil; have a loamy subsoil at a depth of 40 to 80 inches; have bedrock at a depth of 60 to 80 inches; have a dark, organically coated subsoil that is within a depth of 20 inches or at a depth of 30 to 80 inches; or have a dark surface layer that is more than 8 inches thick.

Dissimilar soils that are included with the Myakka soil in mapping occur as small areas of Adamsville, Bradenton, Pineda, Placid, Popash, Pomello, Samsula, and Zolfo soils and soils that have bedrock at a depth of 40 to 60 inches. Bradenton and Pineda soils are in positions on the landscape similar to those of the Myakka soil. Adamsville, Pomello, and Zolfo soils are in the slightly higher landscape positions. Placid, Popash, and Samsula soils are in the lower landscape positions. Bradenton and Pineda soils do not have an organically stained subsoil and have a loamy subsoil within a depth of 40 inches.

The seasonal high water table is within a depth of 12 inches in the Myakka soil for more than 6 months during most years. Areas of this map unit are flooded by storm-driven tides or by the Suwannee River for periods of 2 to 7 days during some years. Permeability is moderate or moderately rapid. Available water capacity is moderate.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Some areas have been planted to pine. Natural vegetation consists mainly of laurel oak, water oak, sweetgum, loblolly pine, slash pine, eastern redcedar, sweetbay, and red maple in the overstory and saw palmetto, cabbage-palm, waxmyrtle, swamp dogwood, poison ivy, and wild grape in the understory. This map unit generally is in the Wetland Hardwood Hammocks ecological community *(24)*.

This soil is not suited to and generally is not used for cropland. Limitations, including flooding and wetness, are impractical to overcome under normal circumstances.

This soil is poorly suited to pasture. The flooding and the wetness are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Native forage species grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness and the flooding. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The flooding and the wetness are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the installation of levees and drainage systems, are necessary to overcome these limitations.

The capability subclass is Vw. The woodland ordination symbol is 8W.

38—Myakka sand. This poorly drained, very deep, nearly level soil is on flatwoods. Individual areas are generally irregular in shape and range from 4 to nearly 2,100 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray sand about 5 inches thick. The subsurface layer is grayish brown sand to a depth of about 18 inches and light gray sand to a depth of 26 inches. The subsoil is organically coated sand. It is black to a depth of about 40 inches and very dark gray to a depth of 58 inches. The underlying material is pale brown sand to a depth of 80 inches or more.

On 90 percent of the acreage mapped as Myakka sand, Myakka and similar soils make up about 76 to 100 percent of the mapped areas. Dissimilar soils make up less than 24 percent. On 10 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Myakka soil but have an organically coated subsoil within a depth of 20 inches or at a depth of 30 to 80 inches, do not have an organically coated subsoil, have a loamy subsoil at a depth of 40 to 80 inches, have bedrock at a depth of 60 to 80 inches, have a surface layer of fine sand, or have a dark surface layer that is more than 8 inches thick.

Dissimilar soils that are included with the Myakka soil in mapping occur as small areas of Adamsville, Cassia, Orsino, Placid, Pomello, Popash, Samsula, and Zolfo soils and soils that have bedrock at a depth of 40 to 60 inches. Adamsville, Cassia, Orsino, Pomello, and Zolfo soils are in the slightly higher landscape positions. Placid, Popash, and Samsula soils are in depressions.

In most years the seasonal high water table is at a depth of 6 to 18 inches in the Myakka soil for 1 to 4 months, but it can recede to a depth of about 60 inches during droughty periods. Permeability is moderate or moderately rapid. Available water capacity is moderate.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture or wildlife habitat. Natural vegetation consists mainly of slash pine and longleaf pine in the overstory and saw palmetto, running oak, sand live oak, pineland threeawn, waxmyrtle, gallberry, fetterbush, and bluestems in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

This soil is poorly suited to cultivated crops. Wetness during the growing season, occasional droughtiness, and low fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during the growing season. Bedding is necessary for most row crops. A well designed sprinkler irrigation system can help to maintain optimum soil moisture during droughty periods. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

This soil is moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods or extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of

wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw. The woodland ordination symbol is 8W.

39—Waccasassa-Demory complex, flooded. These poorly drained, shallow or very shallow, nearly level, soils are on low ridges. They are rarely flooded and occasionally flooded. Individual areas are generally irregular in shape and range from 2 to more than 10,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Waccasassa soil is very dark grayish brown sandy clay loam about 2 inches thick. The subsoil is dark yellowish brown sandy clay loam to a depth of about 12 inches. Limestone bedrock is at a depth of about 12 inches.

Typically, the surface layer of the Demory soil is very dark brown sandy clay loam to a depth of about 6 inches. The underlying material is dark yellowish brown sandy clay loam to a depth of about 11 inches. Limestone bedrock is at a depth of about 11 inches.

Generally, the mapped areas average about 53 percent Waccasassa and similar soils and 37 percent Demory and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Waccasassa and Demory soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Waccasassa-Demory complex, flooded, Waccasassa, Demory, and similar soils make up about 81 to 99 percent of the mapped areas. Dissimilar soils make up about 1 to 19 percent. On 5 percent of the acreage, the dissimilar soils make up more than 19 percent of the mapped areas.

Included in mapping are soils that are similar to the Waccasassa and Demory soils but have a surface layer of fine sand, loamy fine sand, fine sandy loam, or muck that is more than 3 inches thick; have more than 5 percent gravel in the surface layer; are sandy throughout; or have bedrock within a depth of 4 inches.

Dissimilar soils that are included with the Waccasassa and Demory soils in mapping occur as small areas of Aripeka, Boca, Bradenton, Chobee, Hicoria, Matmon, and Pineda soils and rock outcrop. Aripeka and Matmon soils are in the slightly higher landscape positions. Boca, Bradenton, and Pineda soils are in positions on the landscape similar to those of the Waccasassa and Demory soils. Chobee and Hicoria soils are in the lower landscape positions. Boca and Pineda soils are sandy to a depth of 20 inches or more and do not have bedrock within a depth of 20 inches. Bradenton soils do not have bedrock within a depth of 40 inches.

The seasonal high water table is within a depth of 12 inches in the Waccasassa and Demory soils for 2 to 6 months in most years. During dry periods it is within crevices and solution holes in the bedrock. Areas of this map unit are flooded by adjacent creeks for periods of 2 to 7 days during some years. Permeability is moderately slow in both soils. Available water capacity is very low in both soils.

Most areas of this map unit are used for the production of pine trees or support natural vegetation and are used only as wildlife habitat. Other areas are used as pasture. Natural vegetation consists mainly of laurel oak, water oak, sweetgum, blackgum, red maple, basswood, eastern redcedar, loblolly pine, and slash pine in the overstory and cabbage-palm, longleaf uniola, cutgrass, panicums, bluestems, greenbrier, yaupon, poison ivy, false indigo, and desmodium in the understory. This map unit generally is in the Wetland Hardwood Hammocks ecological community *(24)*.

These soils are not suited to and generally are not used for cropland. Limitations, including flooding, wetness, and the shallowness to bedrock, are impractical to overcome under normal circumstances.

These soils are poorly suited to pasture. The main management concerns are the wetness, the flooding, and the thin root zone. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can help to remove excess water more rapidly during wet periods, but special equipment may be needed because of the limited depth to bedrock. During droughty periods, the water table is below the bedrock, and thus sufficient moisture is not available to plant roots. Native forage species grow well if properly managed. Restricting grazing during very wet periods or extended dry periods helps to prevent damage to plant roots. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is low. The main management concerns are the equipment limitation, seedling mortality, plant competition, and windthrow, which are caused by the wetness, the flooding, and the shallowness to bedrock. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Because of the shallowness to bedrock, specialized equipment generally is needed for proper site preparation and tree planting activities. Limiting mechanical operations to the drier periods reduces the

equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine or loblolly pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. Thinning the hardwood overstory instead of clearcutting or leaving some rows of unharvested trees as windbreaks reduces the hazard of windthrow. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The flooding, the shallowness to bedrock, and the wetness are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the installation of levees and the addition of large amounts of fill, are necessary to overcome these limitations.

The capability subclass is VIIs. The woodland ordination symbol is 6D.

40—Pineda fine sand. This poorly drained, very deep, nearly level soil is on sloughs on flatwoods. Individual areas are generally irregular in shape and range from 3 to nearly 350 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 4 inches thick. The subsurface layer is dark gray fine sand to a depth of about 18 inches. The subsoil is brown fine sand to a depth of about 32 inches, dark grayish brown fine sandy loam to a depth of 55 inches, and greenish gray sandy clay loam to a depth of 80 inches or more.

On 80 percent of the acreage mapped as Pineda fine sand, Pineda and similar soils make up about 76 to 86 percent of the mapped areas. Dissimilar soils make up about 14 to 24 percent. On 20 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Pineda soil but have an organically coated subsoil more than 2 inches thick that overlies the loamy subsoil, do not have a sandy subsoil, have bedrock at a depth of 60 to 80 inches, have a loamy subsoil that is at a depth of 40 to 80 inches, do not have sandy intrusions in the upper 2 to 10 inches of the loamy subsoil, or have a dark surface layer that is more than 10 inches thick.

Dissimilar soils that are included with the Pineda soil in mapping occur as small areas of Chobee, Hicoria, Myakka, Placid, Pompano, Popash, and Smyrna soils and soils that have bedrock at a depth of 40 to 60 inches. Myakka, Pompano, and Smyrna soils are in positions on the landscape similar to those of the Pineda soil. Chobee, Hicoria, Placid, and Popash soils are in the lower landscape positions. Myakka, Pompano, and Smyrna soils are sandy to a depth of 80 inches or more. Myakka and Smyrna soils have an organically coated subsoil.

In most years the seasonal high water table is within a depth of 12 inches in the Pineda soil for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is slow or very slow. Available water capacity is low.

Most areas of this map unit are used for pasture or the production of pine trees. Natural vegetation consists mainly of scattered slash pine in the overstory and waxmyrtle, bluestems, maidencane, sand cordgrass, hatpin, pineland threeawn, low panicums, and scattered cabbage-palm and saw palmetto in the understory. This map unit generally is in the North Florida Flatwoods or Slough ecological community *(24)*.

This soil is poorly suited to cultivated crops. Wetness during the growing season and low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Bedding is necessary for most row crops. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

This soil is moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Limiting mechanical operations to the drier periods reduces the equipment

limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IIIw. The woodland ordination symbol is 10W.

41—Demory sandy clay loam, occasionally flooded. This poorly drained, nearly level, shallow or very shallow soil is on low ridges adjacent to or surrounded by areas of tidal marsh. It is occasionally flooded. Individual areas are generally irregular in shape and range from 2 to nearly 3,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface is covered with several inches of undecomposed leaf litter. The surface layer is black muck about 3 inches thick. Below this is very dark grayish brown sandy clay loam about 4 inches thick. The underlying material is dark grayish brown sandy clay loam about 2 inches thick. Limestone bedrock is at a depth of 9 inches.

On 95 percent of the acreage mapped as Demory sandy clay loam, occasionally flooded, Demory and similar soils make up about 78 to 96 percent of the mapped areas. Dissimilar soils make up about 4 to 22 percent. On 5 percent of the acreage, the dissimilar soils make up more than 22 percent of the mapped areas.

Included in mapping are soils that are similar to the Demory soil but do not have a dark surface layer; have a surface layer of fine sand, loamy fine sand, fine sandy loam, or muck that is more than 3 inches thick; have more than 5 percent gravel in the surface layer; have bedrock within a depth of 4 inches; or are sandy throughout.

Dissimilar soils that are included with the Demory soil in mapping occur as small areas of Aripeka, Boca, Bradenton, Chobee, Cracker, and Matmon soils and rock outcrop. Chobee and Cracker soils are in the slightly lower landscape positions. Boca and Bradenton soils are in positions on the landscape similar to those of the Demory soil. Aripeka and Matmon soils are in the slightly higher landscape positions. Boca and Bradenton soils do not have bedrock within a depth of 20 inches. Boca soils are sandy to a depth of 20 inches or more.

The seasonal high water table is within a depth of 12 inches for 2 to 6 months in most years. During dry periods it is within crevices and solution holes in the bedrock. Areas of this map unit are flooded by adjacent creeks or by storm-driven tides for periods of 2 to 7 days during some years. Permeability is moderately slow. Available water capacity is very low.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Other areas are used for the production of pine trees. Natural vegetation consists mainly of laurel oak, water oak, sweetgum, blackgum, red maple, basswood, eastern redcedar, loblolly pine, and slash pine in the overstory and cabbage-palm, longleaf uniola, cutgrass, panicums, bluestems, greenbrier, yaupon, poison ivy, false indigo, and desmodium in the understory. This map unit generally is in the Wetland Hardwood Hammocks ecological community *(24)*.

This soil is not suited to and generally is not used for cropland. Limitations, including flooding, wetness, and the shallowness to bedrock, are impractical to overcome under normal circumstances.

This soil is poorly suited to pasture. The main management concerns are the wetness, the flooding, and the thin root zone. They limit the selection of plant species and the periods of grazing. Residual salinity is a problem in areas nearest to the coast. Shallow surface ditches can help to remove excess water more rapidly during wet periods, but special equipment may be needed because of the limited depth to bedrock. During droughty periods, the water table is below the bedrock, and thus sufficient moisture is not available to plant roots. Native forage species grow well if properly managed. Restricting grazing during very wet periods or extended dry periods helps to prevent damage to plant roots. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is low. The main management concerns are the equipment limitation, seedling mortality, plant competition, and windthrow, which are caused by the wetness, the flooding, and the shallowness to bedrock.

Residual salinity may also be a problem in areas nearest to the coast. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Because of the shallowness to bedrock, specialized equipment generally is needed for proper site preparation and tree planting activities. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine or loblolly pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. Thinning the hardwood overstory instead of clearcutting or leaving some rows of unharvested trees as windbreaks reduces the hazard of windthrow. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The flooding, the shallowness to bedrock, and the wetness are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the installation of levees and the addition of large amounts of fill, are necessary to overcome these limitations.

The capability subclass is VIIs. The woodland ordination symbol is 6D.

42—Ousley-Albany complex, occasionally flooded. These somewhat poorly drained, very deep, nearly level soils are on slightly elevated knolls and ridges on the flood plain of the Suwannee River. They are occasionally flooded. Individual areas are generally elongated and range from 3 to 75 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Ousley soil is gray fine sand to a depth of about 4 inches and light gray fine sand to a depth of 12 inches. The underlying material is fine sand. It is dark brown to a depth of about 18 inches, yellowish brown to a depth of 28 inches, light yellowish brown to a depth of 38 inches, pale brown to a depth of 65 inches, and light gray to a depth of 80 inches or more.

Typically, the surface layer of the Albany soil is light brownish gray fine sand to a depth of about 6 inches. The subsurface layer is brown fine sand to a depth of about 15 inches and light yellowish brown fine sand to a depth of 50 inches. The subsoil is yellowish brown sandy clay loam to a depth of about 65 inches and light gray sandy clay loam to a depth of 80 inches or more.

Generally, the mapped areas average about 50 percent Ousley and similar soils and about 40 percent Albany and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Ousley and Albany soils and of the similar soils are fairly consistent in most mapped areas.

On most of the acreage mapped as Ousley-Albany complex, occasionally flooded, Ousley, Albany, and similar soils make up more than 85 percent of the mapped areas. Dissimilar soils make up less than 15 percent.

Included in mapping are soils that are similar to the Albany soil but have sandy materials underlying the subsoil, have a thinner surface layer, have a loamy subsoil at a depth of 20 to 40 inches, or have base saturation of more than 35 percent in the lower part of the subsoil. Also included are soils that are similar to the Ousley and Albany soils but have a sandy, organically stained subsoil or have a surface layer of sand.

Dissimilar soils that are included with the Ousley and Albany soils in mapping occur as small areas of Bradenton, Chobee, Holopaw, Myakka, Orsino, Pineda, and Pompano soils. Orsino soils are in the slightly higher landscape positions. Bradenton, Chobee, Holopaw, Myakka, Pineda, and Pompano soils are in the lower landscape positions.

The seasonal high water table is at a depth of 18 to 36 inches in the Ousley soil and 12 to 30 inches in the Albany soil for 1 to 4 months during most years. Areas of this map unit are flooded by the adjacent river for periods of 2 to 7 days during some years. Permeability is rapid in the Ousley soil and moderate in the Albany soil. Available water capacity is very low in both soils.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of laurel oak, water oak, water hickory, sweetgum, slash pine, and loblolly pine in the overstory and bluestems, panicums, longleaf uniola, greenbrier, and scattered saw palmetto and cabbage-palm in the understory. This map unit generally is in the Bottomland Hardwoods ecological community *(24)*.

These soils are poorly suited to cultivated crops. The main management concerns are seasonal wetness and occasional flooding, which may delay planting; seasonal droughtiness caused by the very low available water capacity; and low natural fertility. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. A well designed

sprinkler irrigation system can help to maintain optimum soil moisture in the root zone during droughty periods. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth. Green manure crops, including grasses and legumes, should be used in the crop rotation.

These soils are moderately suited to pasture. The main management concerns are the seasonal droughtiness caused by the very low available water capacity in the root zone, the occasional flooding, and the low natural fertility. They limit the selection of plant species and the periods of grazing. Native forage species grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is high. The main management concerns are the equipment limitation, plant competition, and seedling mortality caused by the seasonal wetness and the flooding. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Planting adapted trees, such as slash pine or loblolly pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

The occasional flooding and the seasonal wetness are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, and local roads and streets. Extensive renovation measures generally are necessary on sites for building and roads. These measures include installing levees and drainage systems for flood protection, elevating road bases and the foundations of buildings above normal flood levels, and installing an offsite sewage disposal system in an area that is not prone to flooding. The occasional flooding, the wetness, and the loose, sandy surface layer are severe limitations affecting recreational facilities. Restricting access during wet periods and establishing species of turf grass that are tolerant of traffic and flooding can help to overcome the limitations affecting recreational facilities.

The capability subclass is IIIw. The woodland ordination symbol is 10W for the Ousley soil and 11W for the Albany soil.

43—Tidewater mucky clay, frequently flooded. This very poorly drained, deep and very deep, nearly level soil is in areas of tidal marsh. It is frequently flooded. Individual areas are generally irregular in shape and range from 4 to nearly 6,700 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is very dark brown mucky clay to a depth of about 10 inches, black silty clay to a depth of 24 inches, and black sandy clay loam to a depth of 40 inches. The underlying material is a mixture of black and very dark grayish brown loamy fine sand to a depth of about 76 inches. Limestone bedrock is at a depth of about 76 inches.

On 95 percent of the acreage mapped as Tidewater mucky clay, frequently flooded, Tidewater and similar soils make up about 91 to 100 percent of the mapped areas. Dissimilar soils make up less than 9 percent. On 5 percent of the acreage, the dissimilar soils make up more than 9 percent of the mapped areas.

Included in mapping are soils that are similar to the Tidewater soil but have a surface layer of muck that is 4 to 51 inches thick; have a surface layer of fine sandy loam, sandy clay loam, or sandy clay that is more than 3 inches thick; do not have a dark surface layer as much as 10 inches in thickness; have sandy materials at a depth of 20 to 40 inches; have bedrock at a depth of 30 to 40 inches; or do not have sulfidic materials within a depth of 20 inches.

Dissimilar soils that are included with the Tidewater soil in mapping occur as small areas of Boca, Cracker, Demory, Immokalee, Myakka, Wekiva, Wulfert, and Zolfo soils and soils that have bedrock at a depth of 20 to 30 inches, have sandy materials within a depth of 20 inches, or have an organic surface layer that is more than 51 inches thick. Cracker and Wulfert soils are in positions on the landscape similar to those of the Tidewater soil. Boca, Demory, Immokalee, Myakka, Wekiva, and Zolfo soils are in the slightly higher landscape positions. Cracker soils have limestone bedrock within a depth of 20 inches. Wulfert soils have an organic surface layer that is more than 16 inches thick.

The seasonal high water table is within a depth of 12 inches in the Tidewater soil throughout the year. Areas of this map unit are flooded daily by high tides. Permeability is moderately slow. Available water capacity is low.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of dense stands of black

needlerush. This map unit generally is in the Salt Marsh ecological community *(24)*.

This soil is not suited to and generally is not used for cropland, pasture, or the production of pine trees. Limitations, including flooding, wetness, and salinity, are impractical to overcome under normal circumstances.

The flooding and the wetness are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the installation of levees and drainage systems and the addition of large amounts of fill, are necessary to overcome these limitations. If drained or if used as fill material, this soil becomes extremely acid and thus can support only a limited variety of plants.

The capability subclass is VIIIw. No woodland ordination symbol is assigned.

45—Cracker mucky clay, frequently flooded. This very poorly drained, shallow or very shallow, nearly level soil is in areas of tidal marsh. It is frequently flooded. Individual areas are generally irregular in shape and range from 9 to nearly 5,900 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is black mucky clay to a depth of about 4 inches and very dark gray sandy clay loam to a depth of 12 inches. Limestone bedrock is at a depth of about 12 inches.

On 90 percent of the acreage mapped as Cracker mucky clay, frequently flooded, Cracker and similar soils make up about 76 to 92 percent of the mapped areas. Dissimilar soils make up about 8 to 24 percent. On 10 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Cracker soil but have a surface layer of muck, fine sandy loam, sandy clay loam, or sandy clay that is more than 3 inches thick; are sandy throughout; or have bedrock at a depth of 20 to 30 inches or within a depth of 6 inches.

Dissimilar soils that are included with the Cracker soil in mapping occur as small areas of Boca, Demory, Tidewater, Wekiva, and Wulfert soils and areas of soils that have bedrock at a depth of 20 to 30 inches. Also included are small areas of rock outcrop. Tidewater and Wulfert soils are in positions on the landscape similar to those of the Cracker soil. Boca, Demory, and Wekiva soils are in the slightly higher landscape positions. Tidewater and Wulfert soils do not have bedrock within a depth of 40 inches. Wulfert soils have an organic surface layer that is more than 16 inches thick.

The seasonal high water table is within a depth of 12 inches in the Cracker soil throughout the year. Areas of this map unit are flooded daily by high tides. Permeability is moderate. Available water capacity is very low.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of black needlerush, marshhay cordgrass, saltwort, and glasswort. This map unit generally is in the Salt Marsh ecological community *(24)*.

This soil is not suited to and generally is not used for cropland, pasture, or the production of pine trees. Limitations, including flooding, wetness, salinity, and the shallowness to bedrock, are impractical to overcome under normal circumstances.

The flooding, the shallowness to bedrock, and the wetness are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the installation of levees and drainage systems and the addition of large amounts of fill, are necessary to overcome these limitations.

The capability subclass is VIIIw. No woodland ordination symbol is assigned.

46—Chobee fine sandy loam, limestone substratum, frequently flooded. This very poorly drained, deep or very deep, nearly level soil is on flood plains. It is frequently flooded. Individual areas are generally irregular in shape and range from 3 to nearly 3,500 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is very dark brown muck to a depth of about 3 inches and very dark brown fine sandy loam to a depth of 11 inches. The subsoil is very dark grayish brown sandy clay loam to a depth of about 21 inches, light brownish gray sandy clay loam to a depth of 28 inches, dark greenish gray sandy clay loam to a depth of 54 inches, and a mixture of greenish gray and light greenish gray sandy clay loam to a depth of 68 inches. Limestone bedrock is at a depth of about 68 inches.

On most of the acreage mapped as Chobee fine sandy loam, limestone substratum, frequently flooded, Chobee and similar soils make up more than 85 percent of the mapped areas. Dissimilar soils make up less than 15 percent.

Included in mapping are soils that are similar to the Chobee soil but do not have bedrock within a depth of 80 inches, have bedrock at a depth of 20 to 40 inches, do not have a dark surface layer as much as 10 inches in thickness, have an organic surface layer that is 4 to 16 inches thick, have an average content of clay in the upper 20 inches of the subsoil that is more than 35 percent, or have a surface layer of fine sand, loamy fine sand, or sandy clay loam that is 4 to 20 inches thick.

Dissimilar soils that are included with the Chobee soil in mapping occur as small areas of Boca, Bradenton, Demory, Gator, Hicoria, Pineda, Popash, Waccasassa, and Wekiva soils. Also included are soils that are in positions on the landscape similar to those of the Chobee soil but have bedrock within a depth of 20 inches. Gator, Hicoria, and Popash soils are in positions on the landscape similar to those of the Chobee soil. Boca, Bradenton, Demory, Pineda, Waccasassa, and Wekiva soils are in the higher landscape positions. Gator soils have an organic surface layer that is more than 16 inches thick. Hicoria and Popash soils are sandy to a depth of 20 inches or more.

The seasonal high water table is at or above the surface in the Chobee soil for more than 6 months during most years. Areas of this map unit are flooded by adjacent rivers or creeks for periods of more than 6 months during most years. Permeability is slow. Available water capacity is moderate.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of cypress, red maple, sweetbay, sweetgum, and Florida willow in the overstory and pickerelweed, lizard's-tail, water iris, and scattered cabbage-palm in the understory. This map unit generally is in the Swamp Hardwoods or Cypress Swamp ecological community *(24)*.

This soil is not suited to and generally is not used for cropland, pasture, or the production of pine trees. Limitations, including flooding and wetness, are impractical to overcome under normal circumstances.

The flooding and ponding are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the installation of levees and drainage systems and the addition of large amounts of fill, are necessary to overcome these limitations.

The capability subclass is VIIw. The woodland ordination symbol is 2W.

48—Lutterloh-Moriah complex, 0 to 5 percent slopes. This map unit consists of a very deep Lutterloh soil and a deep or very deep Moriah soil. These somewhat poorly drained, nearly level to gently sloping soils are on karst uplands. Individual areas are generally irregular in shape and range from 3 to nearly 400 acres in size.

Typically, the surface layer of the Lutterloh soil is dark gray fine sand about 7 inches thick. The subsurface layer is light brownish gray fine sand to a depth of about 23 inches, light gray fine sand to a depth of 42 inches, and white fine sand to a depth of 57 inches. The subsoil is light gray sandy clay loam to a depth of about 69 inches and light gray sandy clay to a depth of 80 inches or more.

Typically, the surface layer of the Moriah soil is very dark grayish brown fine sand about 8 inches thick. The subsurface layer is grayish brown fine sand to a depth of about 19 inches and light gray fine sand to a depth of 35 inches. The subsoil is yellowish brown sandy clay loam to a depth of about 39 inches and light brownish gray sandy clay to a depth of 51 inches. Limestone bedrock is at a depth of about 51 inches.

Generally, the mapped areas average about 53 percent Lutterloh and similar soils and 37 percent Moriah and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Lutterloh and Moriah soils and of the similar soils are fairly consistent in most mapped areas.

On 90 percent of the acreage mapped as Lutterloh-Moriah complex, 0 to 5 percent slopes, Lutterloh, Moriah, and similar soils make up about 78 to 100 percent of the mapped areas. Dissimilar soils make up less than 22 percent. On 10 percent of the acreage, the dissimilar soils make up more than 22 percent of the mapped areas.

Included in mapping are soils that are similar to the Moriah soil but do not have bedrock within a depth of 72 inches. Also included are soils that are similar to the Lutterloh and Moriah soils but have a dark surface layer that is more than 9 inches thick, contain more than 35 percent clay in the upper 20 inches of the subsoil, are fine sandy loam or sandy clay loam throughout the subsoil, do not have a subsoil, or have a seasonal high water table at a depth of 42 to 72 inches.

Dissimilar soils that are included with the Lutterloh and Moriah soils in mapping occur as small areas of Bushnell, Hicoria, Holopaw, Jonesville, Levyville, Mabel, Micanopy, Pedro, and Seaboard soils. Bushnell, Jonesville, Levyville, Mabel, Micanopy, Pedro, and Seaboard soils are in positions on the landscape similar to those of the Lutterloh and Moriah soils. Hicoria and Holopaw soils are in the lower landscape positions. Bushnell, Levyville, Mabel, Micanopy, and Pedro soils have a loamy or clayey subsoil within a depth of 20 inches. Jonesville, Levyville, Pedro, and Seaboard soils are better drained than the Lutterloh and Moriah soils. Jonesville, Pedro, and Seaboard soils have limestone bedrock within a depth of 40 inches.

The seasonal high water table is perched at a depth of 18 to 42 inches in the Lutterloh and Moriah soils for 2 to 5 months in most years. Permeability is slow. Available water capacity is very low in the Lutterloh soil and low in the Moriah soil.

Most areas of this map unit are used as pasture or

cropland. Other areas are used for the production of pine trees. Natural vegetation consists mainly of laurel oak, live oak, slash pine, loblolly pine, longleaf pine, magnolia, sweetgum, hickory, and eastern redcedar in the overstory and cabbage-palm, blackberry, American beautyberry, greenbrier, Florida holly, bluestems, and panicums in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are moderately suited to cultivated crops. The main management concerns are seasonal wetness, which may delay planting; seasonal droughtiness caused by the very low or low available water capacity; and low natural fertility. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. A well designed sprinkler irrigation system can help to maintain optimum soil moisture in the root zone during droughty periods. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth. Green manure crops, including grasses and legumes, should be used in the crop rotation.

These soils are well suited to pasture. The main management concerns are the seasonal droughtiness and the low natural fertility. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is high. The main management concerns are the equipment limitation and plant competition caused by the seasonal wetness. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Site preparation should include removing the larger debris to facilitate mechanical operations and chopping the woody understory vegetation to reduce immediate plant competition. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility. A wide variety of trees, including slash pine and loblolly pine, grow well if properly managed.

These soils have moderate limitations affecting sites for residential and commercial buildings and local roads and streets mainly because of the wetness. Installing a subsurface drainage system around the foundations of buildings and installing shallow ditches along roadsides can help to overcome these limitations. The wetness is a severe limitation on sites for septic tank absorption fields. Installing a filtering mound of suitable soil material generally can overcome this limitation. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic can help to overcome these limitations.

The capability subclass is IIIe. The woodland ordination symbol is 10W for the Lutterloh soil and 11S for the Moriah soil.

49—Hicoria fine sand. This poorly drained, very deep, nearly level soil is on broad, low flats. Individual areas are generally irregular in shape and range from 6 to nearly 400 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand to a depth of about 11 inches and very dark grayish brown fine sand to a depth of 17 inches. The subsurface layer is grayish brown loamy fine sand to a depth of about 23 inches. The subsoil is grayish brown sandy clay loam to a depth of about 30 inches and gray sandy clay loam to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Hicoria fine sand, Hicoria and similar soils make up about 81 to 100 percent of the mapped areas. Dissimilar soils make up less than 19 percent. On 5 percent of the acreage, the dissimilar soils make up more than 19 percent of the mapped areas.

Included in mapping are soils that are similar to the Hicoria soil but have a loamy subsoil at a depth of 40 to 80 inches or 12 to 20 inches; have a dark surface layer that is less than 10 inches or more than 24 inches thick; have a surface layer of loamy fine sand or mucky fine sand that is more than 3 inches thick; have an organically stained, sandy subsoil underlying the surface or subsurface layer; or contain an average of more than 35 percent clay in the upper 20 inches of the subsoil.

Dissimilar soils that are included with the Hicoria soil in mapping occur as small areas of Boca, Bushnell, Ft. Green, Hicoria, Lochloosa, Mabel, Moriah, Placid, Pompano, and Popash soils. Hicoria, Placid, and Popash soils are in depressions. Boca, Placid, and Pompano soils are in positions on the landscape similar to those of the Hicoria soil. Bushnell, Ft. Green, Lochloosa, Mabel, and Moriah soils are in the slightly higher landscape positions. Boca soils have limestone bedrock within a depth of 40 inches. Placid and Pompano soils are sandy to a depth of 80 inches or more.

In most years the seasonal high water table is within

a depth of 6 inches in the Hicoria soil for 2 to 6 months, but it is above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is slow or moderately slow. Available water capacity is moderate.

Most areas of this map unit are used for pasture. Natural vegetation consists mainly of maidencane, chalky bluestem, bushybeard bluestem, sand cordgrass, and waxmyrtle. Some areas have slash pine and scattered cabbage-palm in the overstory. This map unit generally is in the Slough ecological community *(24)*.

This soil is poorly suited to cultivated crops. Wetness during the growing season is the main management concern. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Bedding is necessary for most row crops. Proper seedbed preparation and weed control are needed to control competing vegetation.

This soil is moderately suited to pasture. The wetness is the main management concern. It limits the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Native forage species grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping and burning the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw. The woodland ordination symbol is 10W.

50—Hicoria loamy fine sand, depressional. This very poorly drained, very deep, nearly level soil is in depressions on flatwoods or on broad, low flats. It is ponded. Individual areas are generally oval or irregular in shape and range from 2 to nearly 200 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sandy loam to a depth of about 3 inches, very dark gray loamy fine sand to a depth of 15 inches, and very dark grayish brown fine sand to a depth of 22 inches. The subsurface layer is grayish brown fine sand to a depth of about 38 inches. The subsoil is a mixture of gray and dark gray sandy clay loam to a depth of about 43 inches, a mixture of light gray and gray sandy clay loam to a depth of 58 inches, and light gray sandy clay loam to a depth of 80 inches or more.

On most of the acreage mapped as Hicoria loamy fine sand, depressional, Hicoria and similar soils make up more than 85 percent of the mapped areas. Dissimilar soils make up less than 15 percent.

Included in mapping are soils that are similar to the Hicoria soil but have a surface layer of fine sand or fine sandy loam that is more than 3 inches thick, have an organic surface layer that is 3 to 8 inches thick, have a dark surface layer that is less than 10 inches or more than 24 inches thick, have a loamy subsoil at a depth of 40 to 80 inches or 12 to 20 inches, contain an average of more than 35 percent clay in the upper 20 inches of the subsoil, or have bedrock at a depth of 40 to 80 inches.

Dissimilar soils that are included with the Hicoria soil in mapping occur as small areas of Chobee and Placid soils. Also included are soils that are in positions on the landscape similar to those of the Hicoria soil but have bedrock within a depth of 40 inches. Chobee and Placid soils are in positions on the landscape similar to those of the Hicoria soil. Chobee soils are loamy throughout. Placid soils are sandy throughout.

The seasonal high water table is above the surface in the Hicoria soil for more than 6 months during most

years. It is within a depth of 12 inches during most of the rest of the time. Permeability is slow or moderately slow. Available water capacity is low or moderate.

Most areas of this map unit support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of maidencane, pickerelweed, water lily, rushes, and sand cordgrass. Some areas have a woody overstory that consists mainly of cypress, blackgum, red maple, and sweetbay. This map unit generally is in the Freshwater Marsh and Ponds ecological community *(24)*.

This soil is not suited to and generally is not used for cropland, pasture, or the production of pine trees. Limitations, including ponding, are impractical to overcome under normal circumstances.

The ponding is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Extensive renovation measures, including the addition of large amounts of fill and the installation of drainage systems, are necessary to overcome this limitation.

The capability subclass is VIIw. The woodland ordination symbol is 2W.

51—Ft. Green-Bivans complex, 2 to 5 percent slopes. This map unit consists of a poorly drained Ft. Green soil and a somewhat poorly drained Bivans soil. These very deep, gently sloping soils are on uplands. Individual areas are generally irregular in shape and range from 3 to nearly 600 acres in size.

Typically, the surface layer of the Ft. Green soil is dark grayish brown fine sand about 7 inches thick. The subsurface layer is grayish brown fine sand to a depth of about 28 inches and brown loamy fine sand that has many pockets of very dark grayish brown fine sandy loam to a depth of 33 inches. The subsoil is light brownish gray fine sandy loam to a depth of about 46 inches, dark gray sandy clay loam to a depth of 60 inches, a mixture of light greenish gray and gray sandy clay loam to a depth of 67 inches, and a mixture of light gray and gray sandy clay loam to a depth of 80 inches or more.

Typically, the surface layer of the Bivans soil is very dark grayish brown fine sand about 5 inches thick. The subsurface layer is light brownish gray fine sand to a depth of about 17 inches. The subsoil is dark gray sandy clay to a depth of about 39 inches, gray sandy clay to a depth of 50 inches, and gray sandy clay loam to a depth of 70 inches. The underlying material is gray sandy clay to a depth of 80 inches or more.

Generally, the mapped areas average about 56 percent Ft. Green and similar soils and 34 percent Bivans and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Ft. Green and Bivans soils and of the similar soils are fairly consistent in most mapped areas.

On 90 percent of the acreage mapped as Ft. Green-Bivans complex, 2 to 5 percent slopes, Ft. Green, Bivans, and similar soils make up about 77 to 100 percent of the mapped areas. Dissimilar soils make up less than 23 percent. On 10 percent of the acreage, the dissimilar soils make up more than 23 percent of the mapped areas.

Included in mapping are soils that are similar to the Ft. Green soil but have a clayey subsoil or have an organically stained layer that overlies the subsoil. Also included are soils that are similar to the Bivans soil but have a surface layer of loamy sand or sandy loam or contain less than 35 percent clay in the upper 20 inches of the subsoil. Also included are soils that are similar to the Ft. Green and Bivans soils but have bedrock below a depth of 60 inches, have a dark surface layer that is more than 7 inches thick, have base saturation of less than 35 percent in the lower part of the subsoil, have sandy material underlying the subsoil, have slopes of less than 2 percent or more than 5 percent, or have a seasonal high water table at a depth of 18 to 40 inches.

Dissimilar soils that are included with the Ft. Green and Bivans soils in mapping occur as small areas of Adamsville, Bushnell, Hicoria, Lutterloh, and Sparr soils and soils that have bedrock at a depth of 40 to 60 inches. Adamsville, Bushnell, Lutterloh, and Sparr soils are in positions on the landscape similar to those of the Ft. Green and Bivans soils. Hicoria soils are in depressions. Adamsville, Lutterloh, and Sparr soils are sandy to a depth of 40 inches or more. Bushnell soils have limestone bedrock within a depth of 40 inches.

The seasonal high water table is at a depth of 6 to 18 inches in the Ft. Green and Bivans soils for 1 to 4 months during most years. Permeability is slow or moderately slow in the Ft. Green soil and slow or very slow in the Bivans soil. Available water capacity is moderate in both soils.

Most areas of this map unit are used as pasture or cropland. Other areas are used for the production of pine trees. Natural vegetation consists mainly of laurel oak, live oak, slash pine, loblolly pine, magnolia, sweetgum, hickory, and eastern redcedar in the overstory and blackberry, American beautyberry, greenbrier, holly, bluestems, panicums, and scattered cabbage-palm and saw palmetto in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are poorly suited to cultivated crops. The main management concerns are seasonal wetness,

which may delay planting, and the hazard of erosion. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. Conservation practices, such as farming on the contour, applying a system of conservation tillage, and terracing, can minimize loss of topsoil caused by erosion. Proper seedbed preparation, weed control, and applications of lime and fertilizer generally can assure high yields.

These soils are moderately suited to pasture. Wetness is the main management concern. It limits the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is high. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine or loblolly pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

The wetness and the restricted permeability in the subsoil are severe limitations on sites for septic tank absorption fields. Installing a filtering mound of suitable soil material can help to overcome these limitations. The wetness and the shrink-swell potential in the subsoil are severe limitations on sites for residential and commercial buildings and local roads and streets. Filling, which raises building foundations above the level of the seasonal wetness, and constructing buildings with a reinforced foundation or a floating slab can help to overcome the limitations affecting buildings and minimize the hazard of foundation and wall cracking. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Limitations affecting recreational facilities are severe because of the wetness and the loose, sandy surface layer. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome these limitations.

The capability subclass is IIIw. The woodland ordination symbol is 10W for the Ft. Green soil and 11W for the Bivans soil.

55—Pedro-Jonesville-Shadeville complex, 0 to 5 percent slopes. This map unit consists of a well drained, shallow or very shallow Pedro soil; a well drained, moderately deep Jonesville soil; and a moderately well drained, deep or very deep Shadeville soil. These nearly level to gently sloping soils are on karst uplands. Individual areas are generally irregular in shape and range from 5 to more than 6,000 acres in size.

Typically, the surface layer of the Pedro soil is dark grayish brown fine sand about 8 inches thick. The subsurface layer is brownish yellow fine sand to a depth of about 11 inches. The subsoil is dark yellowish brown fine sandy loam to a depth of about 15 inches. Soft, unconsolidated limestone that can be dug with a spade is at a depth of about 15 inches. Harder limestone bedrock is at a depth of about 21 inches.

Typically, the surface layer of the Jonesville soil is dark gray fine sand about 9 inches thick. The subsurface layer is a mixture of very pale brown and light gray fine sand to a depth of about 31 inches. The subsoil is dark yellowish brown fine sandy loam to a depth of about 35 inches. Limestone bedrock is at a depth of about 35 inches.

Typically, the surface layer of the Shadeville soil is dark grayish brown fine sand to a depth of about 10 inches. The subsurface layer is a mixture of pale brown and yellowish brown fine sand to a depth of about 23 inches. The subsoil is yellowish brown sandy clay loam to a depth of about 45 inches. Limestone bedrock is at a depth of about 45 inches.

Generally, the mapped areas average about 61 percent Pedro and similar soils, 19 percent Jonesville and similar soils, and 17 percent Shadeville and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Pedro, Jonesville, and Shadeville soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Pedro-Jonesville-Shadeville complex, 0 to 5 percent slopes, Pedro, Jonesville, Shadeville, and similar soils make up about 91 to 100 percent of the mapped areas. Dissimilar soils make up less than 9 percent. On 5

percent of the acreage, the dissimilar soils make up more than 9 percent of the mapped areas.

Included in mapping are soils that are similar to the Pedro soil but have bedrock within a depth of 6 inches, do not have limestone within a depth of 20 inches, have a surface layer of loamy fine sand or fine sandy loam, or have a surface layer that contains more than 1 percent gravel. Also included are soils that are similar to the Pedro and Jonesville soils but do not have a subsoil, contain an average of more than 35 percent clay throughout the subsoil, have a perched seasonal high water table, or do not have consolidated bedrock within a depth of 40 inches. Also included are soils that are similar to the Shadeville soil but do not have bedrock within a depth of 72 inches, contain more than 35 percent clay in the upper 20 inches of the subsoil, have a dark surface layer that is more than 10 inches thick, or have a seasonal high water table that is perched at a depth of 20 to 48 inches.

Dissimilar soils that are included with the Pedro, Jonesville, and Shadeville soils in mapping occur as small areas of Candler, Hicoria, Lutterloh, Otela, and Tavares soils. Also included are small areas of rock outcrop and rock pits and areas of sloping soils on the edges of sinkholes. Candler, Lutterloh, Otela, and Tavares soils are in positions on the landscape similar to those of the Pedro, Jonesville, and Shadeville soils. Hicoria soils are in depressions. Candler and Tavares soils are sandy to a depth of 80 inches or more. Lutterloh and Otela soils are sandy to a depth of 40 to 80 inches. Lutterloh soils are somewhat poorly drained.

The seasonal high water table is below the bedrock in the Pedro and Jonesville soils throughout the year. It is perched at a depth of 48 to 72 inches in the Shadeville soil for 1 to 3 months during most years. Permeability is moderately rapid in the Pedro soil, moderately slow or moderate in the Jonesville soil, and moderate in the Shadeville soil. Available water capacity is very low in the Pedro and Jonesville soils and low in the Shadeville soil.

Most areas of this map unit are used as pasture or cropland. Other areas are used for the production of pine trees or have been subdivided for residential development. Natural vegetation consists mainly of laurel oak, live oak, slash pine, loblolly pine, longleaf pine, magnolia, sweetgum, hickory, and eastern redcedar in the overstory and cabbage-palm, blackberry, American beautyberry, greenbrier, Florida holly, bluestems, pineland threeawn, and panicums in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are moderately suited to cultivated crops. The main management concerns are seasonal droughtiness, a thin root zone, and the shallowness to bedrock. A well designed sprinkler irrigation system can help to maintain optimum soil moisture during droughty periods. Returning crop residue to the soil can increase the content of organic matter and the water-holding capacity of the topsoil. Special cultivation equipment may be needed because of the limited depth to bedrock. Proper seedbed preparation, weed control, and applications of lime and fertilizer generally can assure high yields.

These soils are well suited to pasture. The main management concerns are the seasonal droughtiness and the thin root zone. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is high. The main management concerns are seedling mortality and windthrow, which are caused by the seasonal droughtiness and the shallowness to bedrock; the equipment limitation, which is caused by the shallowness to bedrock and the loose, sandy surface layer; and plant competition. Planting adapted trees, such as slash pine, and planting during the wetter months reduce the seedling mortality rate. Leaving some rows of unharvested, mature trees as windbreaks reduces the hazard of windthrow. Because of the shallowness to bedrock, specialized equipment may be needed for proper site preparation and tree planting activities. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

Pedro and Jonesville soils have severe limitations affecting sites for septic tank absorption fields mainly because of the depth to bedrock. Shadeville soils have moderate limitations affecting sites for septic tank absorption fields because of the depth to bedrock, wetness, and moderate permeability in the subsoil. Careful site investigation is needed to locate suitably large areas that are deep enough over bedrock. Installing an oversized septic tank absorption field and avoiding the clustering of homes and septic systems can help to overcome the limitations and minimize the hazard of ground-water pollution. The Pedro soil has moderate limitations on sites for residential and commercial buildings and local roads and streets, and

the Jonesville and Shadeville soils have slight limitations. Areas of soils that are shallow or very shallow over bedrock are common throughout this map unit, but careful site investigation usually can locate suitably large areas for building foundations that are deep enough over bedrock. Because of the shallowness to bedrock, special equipment may be needed for the installation of ditches or pipelines. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer and the shallowness to bedrock. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations.

The capability subclass is IVs for the Pedro soil, IIIs for the Jonesville soil, and IIs for the Shadeville soil. The woodland ordination symbol is 10S for the Pedro and Jonesville soils and 11S for the Shadeville soil.

56—Moriah-Bushnell-Mabel, limestone substratum, complex, 0 to 5 percent slopes. This map unit consists of somewhat poorly drained, deep or very deep Moriah and Mabel soils and a somewhat poorly drained, moderately deep Bushnell soil. These nearly level to gently sloping soils are on karst uplands. Individual areas are generally irregular in shape and range from 4 to nearly 400 acres in size.

Typically, the surface layer of the Moriah soil is dark gray fine sand about 9 inches thick. The subsurface layer is very pale brown fine sand to a depth of about 16 inches and white fine sand to a depth of 28 inches. The subsoil is light yellowish brown fine sandy loam to a depth of about 32 inches, light gray sandy clay loam to a depth of 44 inches, light gray fine sandy loam to a depth of 52 inches, and light gray clay to a depth of 68 inches. Limestone bedrock is at a depth of about 68 inches.

Typically, the surface layer of the Bushnell soil is dark grayish brown fine sand about 6 inches thick. The subsurface layer is brown fine sand to a depth of about 10 inches. The subsoil is yellowish brown sandy clay to a depth of about 16 inches and yellowish brown clay to a depth of 26 inches. Limestone bedrock is at a depth of about 26 inches.

Typically, the surface layer of the Mabel soil is dark grayish brown fine sand about 7 inches thick. The subsurface layer is yellowish brown fine sand to a depth of about 14 inches. The subsoil is brown sandy clay loam to a depth of about 18 inches, yellowish brown clay to a depth of 31 inches, and light gray clay to a depth of 53 inches. Limestone bedrock is at a depth of about 53 inches.

Generally, the mapped areas average about 34 percent Moriah and similar soils, 29 percent Bushnell and similar soils, and 23 percent Mabel and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Moriah, Bushnell, and Mabel soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as Moriah-Bushnell-Mabel, limestone substratum, complex, 0 to 5 percent slopes, Moriah, Bushnell, Mabel, and similar soils make up about 78 to 93 percent of the mapped areas. Dissimilar soils make up about 7 to 22 percent. On 20 percent of the acreage, the dissimilar soils make up more than 22 percent of the mapped areas.

Included in mapping are soils that are similar to the Moriah soil but contain an average of more than 35 percent clay in the upper 20 inches of the subsoil, have bedrock at a depth of 24 to 40 inches, do not have bedrock within a depth of 72 inches, have a dark surface layer that is more than 9 inches thick, or have a perched high water table at a depth of 42 to 72 inches. Also included are soils that are similar to the Bushnell and Mabel soils but have a surface layer of loamy fine sand or fine sandy loam, have a surface layer that contains more than 5 percent gravel, do not have a perched high water table within a depth of 36 inches, do not have bedrock within a depth of 72 inches, have a dark surface layer that is more than 6 inches thick that overlies the subsoil, have bedrock at a depth of 12 to 20 inches, or contain an average of less than 35 percent clay in the upper 20 inches of the subsoil.

Dissimilar soils that are included with the Moriah, Bushnell, and Mabel soils in mapping occur as small areas of Adamsville, Bivans, Ft. Green, Hicoria, Lutterloh, Otela, and Tavares soils; soils that have bedrock within a depth of 12 inches; and sloping soils that are near the edges of sinkholes. Adamsville, Bivans, Ft. Green, Lutterloh, Otela, and Tavares soils are in positions on the landscape similar to those of the Moriah, Bushnell, and Mabel soils. Hicoria soils are in depressions. Adamsville, Lutterloh, Otela, and Tavares soils are sandy to a depth of 40 inches or more. Bivans and Ft. Green soils do not have bedrock within a depth of 80 inches.

The seasonal high water table is perched at a depth of 18 to 42 inches in the Moriah soil for 1 to 3 months during most years. It is perched at a depth of 18 to 36 inches in the Bushnell and Mabel soils for 1 to 3 months during most years. In all three soils, it may be at a depth of 12 to 20 inches for several days following heavy rains. Permeability is slow in all three soils. Available water capacity is low in the Moriah and Bushnell soils and moderate in the Mabel soil.

Most areas of this map unit are used as pasture or cropland. Other areas are used for the production of

pine trees. Natural vegetation consists mainly of laurel oak, water oak, slash pine, loblolly pine, live oak, magnolia, sweetgum, hickory, and eastern redcedar in the overstory and blackberry, American beautyberry, greenbrier, Florida holly, bluestems, panicums, and scattered cabbage-palm and saw palmetto in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are moderately suited to cultivated crops. The main management concerns are seasonal wetness, which may delay planting, and the hazard of erosion. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. Conservation practices, such as farming on the contour, applying a system of conservation tillage, and terracing, can minimize loss of topsoil caused by erosion. Proper seedbed preparation, weed control, and applications of lime and fertilizer generally can assure high yields.

These soils are well suited to pasture. A wide variety of plants, including Pensacola bahiagrass and hairy indigo, grow well if properly managed. Proper stocking rates, pasture rotation, and applications of fertilizer generally are adequate to keep the pasture in good condition.

The potential productivity of these soils for pine trees is high. The main management concerns are the equipment limitation and plant competition caused by the seasonal wetness. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Site preparation should include removing the larger debris to facilitate mechanical operations and chopping and burning the woody understory vegetation to reduce immediate plant competition. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility. A wide variety of trees, including slash pine and loblolly pine, grow well if properly managed.

Wetness, depth to bedrock, and slow permeability in the subsoil are severe limitations on sites for septic tank absorption fields. Careful site investigation is needed to locate suitably large areas that are deep enough over bedrock. Installing a filtering mound of suitable soil material can help to overcome the limitations. The Bushnell and Mabel soils have severe limitations on sites for residential and commercial buildings and local roads and streets because of the shrink-swell potential in the subsoil. The Moriah soil has moderate limitations on sites for residential and commercial buildings and local roads and streets because of the wetness. Constructing buildings with a reinforced foundation or a floating slab can help to overcome the limitations affecting buildings and minimizes the hazard of foundation and wall cracking. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic can help to overcome these limitations.

The capability subclass is IIIw. The woodland ordination symbol is 11S for the Moriah soil and 11W for the Bushnell and Mabel soils.

57—Paola fine sand, gently rolling. This excessively drained, very deep, gently rolling soil is on the tops of dunelike ridges and on islands in the Gulf of Mexico. Individual areas are generally oval or elongated and range from 2 to nearly 500 acres in size. Slopes are complex. They range from 2 to 8 percent but are mainly 5 to 8 percent.

Typically, the surface layer is gray fine sand about 2 inches thick. The subsurface layer is light gray fine sand to a depth of about 11 inches. The subsoil is a mixture of yellowish brown and very pale brown fine sand to a depth of about 16 inches, yellowish brown fine sand to a depth of 26 inches, brownish yellow fine sand to a depth of 68 inches, and yellow fine sand to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Paola fine sand, gently rolling, Paola and similar soils make up about 90 to 100 percent of the mapped areas. Dissimilar soils make up less than 10 percent. On 5 percent of the acreage, the dissimilar soils make up more than 10 percent of the mapped areas.

Included in mapping are soils that are similar to the Paola soil but do not have a subsurface layer that is more than 6 inches thick, have a seasonal high water table at a depth of 40 to 72 inches, or have a layer of coarse shell fragments at the surface that is 3 to 20 inches thick.

Dissimilar soils that are included with the Paola soil in mapping occur as small areas of Adamsville, Cassia, Immokalee, Myakka, Placid, Pomello, Pompano, Popash, Samsula, and Zolfo soils. Adamsville, Cassia, Immokalee, Myakka, Pomello, Pompano, and Zolfo soils are in the slightly lower landscape positions. Placid, Popash, and Samsula soils are in depressions.

The seasonal high water table is below a depth of 72 inches in the Paola soil throughout the year. Permeability is very rapid. Available water capacity is very low.

Most areas of this map unit are used for the production of pine trees or as wildlife habitat. Small areas are used as pasture or have been subdivided for residential development. Natural vegetation consists mainly of live oak, turkey oak, longleaf pine, and sand pine in the overstory and saw palmetto, Spanish bayonet, pineland threeawn, bluestems, and reindeer

moss in the understory. This map unit generally is in the Upland Hardwood Hammocks or Longleaf Pine-Turkey Oak Hills ecological community *(24)*.

This soil is very poorly suited to cultivated crops. Prolonged droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. In many areas, however, irrigation may be difficult to install because of the slope. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

This soil is poorly suited to pasture. The prolonged droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Pastures should be established or renovated during the wetter months. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is low. The main management concerns are seedling mortality caused by the prolonged droughtiness and the low fertility and the equipment limitation caused by the loose, sandy surface layer. Planting adapted trees, such as sand pine, and planting during the wetter months reduce the seedling mortality rate. Establishing a close-growing cover crop before planting can help to stabilize the sandy surface layer, improve trafficability, and increase the available water capacity of the topsoil. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation.

This soil has only slight limitations affecting sites for septic tank absorption fields, residential buildings, and local roads and streets. Taking care not to cluster homes and septic systems minimizes the hazard of ground-water pollution. Limitations affecting commercial buildings are moderate because of the slope. Limitations affecting recreational facilities are severe because of the loose, sandy surface layer. Establishing turf grasses that are tolerant of droughtiness and traffic can help to stabilize the surface layer. Applications of mulch, applications of fertilizer, frequent irrigation, and restricted access are generally required.

The capability subclass is VIs. The woodland ordination symbol is 2S.

58—Boca-Holopaw, limestone substratum, complex. This map unit consists of a moderately deep Boca soil and a deep or very deep Holopaw soil. These poorly drained, nearly level soils are on low ridges and flatwoods. Individual areas are generally irregular in shape and range from 3 to nearly 1,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Boca soil is black fine sand about 5 inches thick. The subsurface layer is light gray fine sand to a depth of about 15 inches, light brownish gray fine sand to a depth of 25 inches, and brown fine sand to a depth of 29 inches. The subsoil is olive brown sandy clay loam to a depth of about 37 inches. Limestone bedrock is at a depth of about 37 inches.

Typically, the surface layer of the Holopaw soil is black fine sand about 5 inches thick. The subsurface layer is a mixture of gray and dark grayish brown fine sand to a depth of about 20 inches, light brownish gray fine sand to a depth of 35 inches, pale brown fine sand to a depth of 41 inches, and a mixture of grayish brown and very dark grayish brown fine sand to a depth of 43 inches. The subsoil is dark gray sandy clay loam to a depth of about 48 inches and gray fine sandy loam to a depth of 65 inches. Limestone bedrock is at a depth of about 65 inches.

Generally, the mapped areas average about 69 percent Boca and similar soils and 22 percent Holopaw and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Boca and Holopaw soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Boca-Holopaw, limestone substratum, complex, Boca, Holopaw, and similar soils make up about 83 to 98 percent of the mapped areas. Dissimilar soils make up about 2 to 17 percent. On 5 percent of the acreage, the dissimilar soils make up more than 17 percent of the mapped areas.

Included in mapping are soils that are similar to the Boca soil but do not have bedrock within a depth of 40 inches, have an organically stained layer that overlies the subsoil or the bedrock, have a loamy subsoil within a depth of 20 inches, do not have a loamy subsoil, or have a surface layer that is more than 9 inches thick. Also included are soils that are similar to the Holopaw soil but do not have bedrock within a depth of 80 inches; have a dark, organically stained layer that is

more than 2 inches thick overlying the loamy subsoil; do not have a loamy subsoil; or have a dark surface layer that is more than 7 inches thick.

Dissimilar soils that are included with the Boca and Holopaw soils in mapping occur as small areas of Aripeka, Bradenton, Chobee, Hallandale, Hicoria, Matmon, Placid, Popash, and Waccasassa soils. Aripeka and Matmon soils are in the slightly higher landscape positions. Bradenton, Hallandale, and Waccasassa soils are in positions on the landscape similar to those of the Boca and Holopaw soils. Chobee, Hicoria, Placid, and Popash soils are in the lower landscape positions. Bradenton and Waccasassa soils have a loamy subsoil within a depth of 20 inches. Hallandale and Waccasassa soils have limestone bedrock within a depth of 20 inches.

In most years the seasonal high water table is within a depth of 12 inches in the Boca and Holopaw soils for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is moderate in the Boca soil and moderately slow or moderate in the Holopaw soil. Available water capacity is very low in the Boca soil and moderate in the Holopaw soil.

Most areas of this map unit are used for pasture or the production of pine trees. Natural vegetation consists mainly of slash pine, loblolly pine, sweetgum, laurel oak, and cabbage-palm in the overstory and bluestems, blackberry, poison ivy, hatpin, gallberry, waxmyrtle, fetterbush, maidencane, and scattered saw palmetto in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

These soils are poorly suited to cultivated crops. Wetness during the growing season and low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Bedding is necessary for most row crops. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

These soils are moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

The wetness and the depth to bedrock are severe limitations on sites for septic tank absorption fields. Careful site investigation is needed to locate suitably large areas that are deep enough over bedrock. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. The wetness is a severe limitation affecting residential and commercial buildings, local roads and streets, and recreational facilities. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IIIw for the Boca soil and IVw for the Holopaw soil. The woodland ordination symbol is 8W for the Boca soil and 10W for the Holopaw soil.

59—Aripeka-Matmon complex. This map unit consists of a moderately deep Aripeka soil and a shallow Matmon soil. These somewhat poorly drained, nearly level soils are on low ridges. Individual areas are

generally irregular in shape and range from 3 to nearly 800 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Aripeka soil is dark grayish brown fine sand about 6 inches thick. The subsoil is yellowish brown fine sand to a depth of about 12 inches and strong brown fine sandy loam to a depth of 24 inches. Limestone bedrock is at a depth of about 24 inches.

Typically, the surface layer of the Matmon soil is very dark grayish brown fine sand about 3 inches thick. The subsurface layer is brown fine sand to a depth of about 6 inches. The subsoil is strong brown sandy clay loam to a depth of about 15 inches. Soft, unconsolidated limestone that can be dug with a spade is at a depth of about 15 inches. Harder limestone bedrock is at a depth of about 24 inches.

Generally, the mapped areas average about 52 percent Aripeka and similar soils and 34 percent Matmon and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Aripeka and Matmon soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Aripeka-Matmon complex, Aripeka, Matmon, and similar soils make up about 80 to 92 percent of the mapped areas. Dissimilar soils make up about 8 to 20 percent. On 5 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Included in mapping are soils that are similar to the Aripeka and Matmon soils but have a surface layer of loamy fine sand or fine sandy loam, contain an average of more than 35 percent clay throughout the subsoil, do not have bedrock within a depth of 40 inches, or have bedrock within a depth of 10 inches.

Dissimilar soils that are included with the Aripeka and Matmon soils in mapping occur as small areas of Boca, Bradenton, Chobee, Hicoria, Moriah, Waccasassa, and Wekiva soils. Also included are small areas of rock outcrop. Chobee and Hicoria soils are in the lower landscape positions. Boca, Bradenton, Waccasassa, and Wekiva soils are in the slightly lower landscape positions. Moriah soils are in positions on the landscape similar to those of the Aripeka and Matmon soils. Moriah soils are sandy to a depth of 20 to 40 inches.

The seasonal high water table is within crevices and solution holes in the bedrock at a depth of 18 to 30 inches in the Aripeka soil for more than 6 months during most years. It is at a depth of 12 to 24 inches in the Matmon soil. Water may be perched above the loamy subsoil or may be ponded on the surface for several days following heavy rains. Permeability is moderate or moderately slow in the Aripeka soil and moderately slow in the Matmon soil. Available water capacity is very low in both soils.

Most areas of this map unit are used for pasture or the production of pine trees. Small areas are used as cropland or support natural vegetation and serve only as wildlife habitat. Natural vegetation consists mainly of live oak, water oak, laurel oak, eastern redcedar, sweetgum, magnolia, slash pine, and loblolly pine in the overstory and cabbage-palm, greenbrier, yaupon, brackenfern, poison ivy, bluestems, and panicums in the understory. This map unit generally is in the Wetland Hardwood Hammocks ecological community *(24)*.

These soils are poorly suited to cultivated crops. The main management concerns are seasonal wetness, which may delay planting; a thin root zone; and the shallowness to bedrock. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. Because of the shallowness to bedrock, special equipment may be needed. During droughty periods, the water table is below the bedrock, and thus sufficient moisture is not available to plant roots. Special cultivation equipment may be needed because of the limited depth to bedrock. Proper seedbed preparation and weed control generally are needed to control competing vegetation.

These soils are moderately suited to pasture. Seasonal wetness and the thin root zone are the main management concerns. They limit the periods of grazing. Restricting grazing during very wet periods or extended dry periods helps to prevent damage to plant roots. A wide variety of plants, including Pensacola bahiagrass (fig. 8) and hairy indigo, grow well if properly managed. Proper stocking rates and pasture rotation generally are adequate to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are the equipment limitation, plant competition, and windthrow, which is caused by the seasonal wetness and the shallowness to bedrock. Site preparation should include removing the larger debris to facilitate mechanical operations and chopping the woody understory vegetation to reduce immediate plant competition. Because of the shallowness to bedrock, specialized equipment may be needed for proper site preparation and tree planting activities. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. Thinning the hardwood overstory instead of clearcutting or leaving some rows of unharvested

Figure 8.—Bahiagrass pasture in an area of Aripeka-Matmon complex.

trees as windbreaks reduces the hazard of windthrow. A wide variety of trees, including slash pine and loblolly pine, grow well if properly managed. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

The wetness and the depth to bedrock are severe limitations on sites for septic tank absorption fields and residential buildings. Careful site investigation is needed to locate suitably large areas that are deep enough over bedrock. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. The wetness and the depth to bedrock are moderate limitations affecting local roads and streets. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome these limitations, but special equipment may be needed because of the shallow bedrock. Limitations affecting most recreational facilities are severe because of the wetness, the depth to bedrock, and the loose, sandy surface layer. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw for the Aripeka soil and IVs for the Matmon soil. The woodland ordination symbol is 10W for the Aripeka soil and 9W for the Matmon soil.

60—EauGallie-Holopaw complex, limestone substratum. These poorly drained, deep or very deep, nearly level soils are on flatwoods. Individual areas are generally irregular in shape and range from 4 to nearly 3,200 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the EauGallie soil is very dark gray fine sand about 6 inches thick. The subsurface layer is gray fine sand to a depth of about 16 inches. The upper subsoil is black, organically

coated fine sand to a depth of about 19 inches; brown fine sand to a depth of 25 inches; and yellowish brown fine sand to a depth of 35 inches. Below this, to a depth of about 55 inches, is an intervening layer of very pale brown fine sand. The lower subsoil is gray fine sandy loam to a depth of about 61 inches. Limestone bedrock is at a depth of about 61 inches.

Typically, the surface layer of the Holopaw soil is very dark gray fine sand about 6 inches thick. The subsurface layer is gray fine sand to a depth of about 9 inches, grayish brown fine sand to a depth of 19 inches, and pale brown fine sand to a depth of 42 inches. The subsoil is olive gray sandy clay loam to a depth of about 52 inches. Limestone bedrock is at a depth of about 52 inches.

Generally, the mapped areas average about 61 percent EauGallie and similar soils and 23 percent Holopaw and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the EauGallie and Holopaw soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as EauGallie-Holopaw complex, limestone substratum, EauGallie, Holopaw, and similar soils make up about 77 to 91 percent of the mapped areas. Dissimilar soils make up about 9 to 23 percent. On 20 percent of the acreage, the dissimilar soils make up more than 23 percent of the mapped areas.

Included in mapping are soils that are similar to the EauGallie and Holopaw soils but do not have bedrock within a depth of 80 inches; have bedrock at a depth of 40 to 50 inches; have a sandy, organically coated subsoil at a depth of 30 to 50 inches; or do not have a loamy subsoil within a depth of 80 inches. Also included are soils that are similar to the Holopaw soil but have a subsurface layer that has colors in shades of yellowish brown or brownish yellow.

Dissimilar soils that are included with the EauGallie and Holopaw soils in mapping occur as small areas of Boca, Chobee, Hallandale, Hicoria, Janney, Pineda, Placid, and Popash soils. Boca, Hallandale, Janney, and Pineda soils are in positions on the landscape similar to those of the EauGallie and Holopaw soils. Chobee, Hicoria, Placid, and Popash soils are in the lower landscape positions. Boca, Hallandale, and Janney soils have limestone bedrock within a depth of 40 inches. Pineda and Boca soils have a loamy subsoil within a depth of 40 inches.

During most years the seasonal high water table is within a depth of 12 inches in the EauGallie and Holopaw soils for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is moderately slow or moderate. Available water capacity is low.

Most areas of this map unit are used for the production of pine trees. Other areas are used as pasture, cropland, or wildlife habitat. Natural vegetation consists mainly of slash pine in the overstory and saw palmetto, cabbage-palm, pineland threeawn, bluestems, waxmyrtle, fetterbush, and gallberry in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

These soils are poorly suited to cultivated crops. Wetness during the growing season and low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Bedding is necessary for most row crops. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

These soils are moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw. The woodland ordination symbol is 10W.

62—Millhopper-Bonneau complex, 1 to 5 percent slopes. These moderately well drained, very deep, nearly level to gently sloping soils are on uplands. Individual areas are generally irregular in shape and range from 5 to nearly 1,650 acres in size.

Typically, the surface layer of the Millhopper soil is very dark grayish brown fine sand to a depth of about 9 inches. The subsurface layer is pale brown fine sand to a depth of about 30 inches, very pale brown fine sand to a depth of 42 inches, and light gray fine sand to a depth of 74 inches. The subsoil is pale brown fine sandy loam to a depth of 80 inches or more.

Typically, the surface layer of the Bonneau soil is dark gray fine sand about 7 inches thick. The subsurface layer is pale brown fine sand to a depth of about 29 inches. The subsoil is light yellowish brown sandy clay loam to a depth of about 37 inches and light yellowish brown fine sandy loam to a depth of 60 inches. The underlying material is light gray fine sandy loam to a depth of 80 inches or more.

Generally, the mapped areas average about 53 percent Millhopper and similar soils and 44 percent Bonneau and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Millhopper and Bonneau soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Millhopper-Bonneau complex, 1 to 5 percent slopes, Millhopper, Bonneau, and similar soils make up about 93 to 100 percent of the mapped areas. Dissimilar soils make up less than 7 percent. On 5 percent of the acreage, the dissimilar soils make up more than 7 percent of the mapped areas.

Included in mapping are soils that are similar to the Millhopper soil but do not have a seasonal high water table within a depth of 72 inches or have a dark surface layer that is more than 9 inches thick. Also included are soils that are similar to the Bonneau soil but have sandy materials underlying the subsoil, have a seasonal high water table below a depth of 72 inches, or have a dark surface layer that is more than 9 inches thick. Also included are soils that are similar to the Millhopper and Bonneau soils but have bedrock at a depth of 60 to 80 inches.

Dissimilar soils that are included with the Millhopper and Bonneau soils in mapping occur as small areas of Adamsville, Astatula, Candler, Levyville, Lochloosa, Orlando, Sparr, and Tavares soils and soils that are in the more sloping areas. Astatula, Candler, Levyville, Orlando, and Tavares soils are in positions on the landscape similar to those of the Millhopper and Bonneau soils. Adamsville, Lochloosa, and Sparr soils are in the lower landscape positions.

The seasonal high water table is perched at a depth of 42 to 72 inches in the Millhopper and Bonneau soils for 1 to 3 months during most years. Permeability is slow to moderate. Available water capacity is low.

Most areas of this map unit are used as pasture or cropland. Other areas are used for the production of pine trees or have been subdivided for residential development. Natural vegetation consists mainly of live oak, laurel oak, loblolly pine, longleaf pine, slash pine, and scattered turkey oak in the overstory and blackberry, pineland threeawn, greenbrier, brackenfern, bluestems, and scattered saw palmetto and cabbage-palm in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are moderately suited to cultivated crops. Droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

These soils are well suited to pasture. Seasonal droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is high. The main management concerns are seedling mortality caused by the seasonal droughtiness and the low fertility; the equipment limitation caused by the loose, sandy surface layer; and, in some areas, plant competition. Planting adapted trees, such as slash pine, and planting during the wetter months reduce the seedling mortality rate. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

These soils have only slight limitations affecting sites for residential and commercial buildings and local roads and streets. Seasonal wetness is a moderate limitation on sites for septic tank absorption fields. Installing an oversized septic tank absorption field and taking care not to cluster homes and septic systems can help to overcome this limitation and minimize the hazard of ground-water pollution. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations. Applications of mulch, applications of fertilizer, and irrigation generally are needed to establish turf grasses.

The capability subclass is IIIs for the Millhopper soil and IIs for the Bonneau soil. The woodland ordination symbol is 10S for the Millhopper soil and 11S for the Bonneau soil.

65—Sparr-Lochloosa complex, 1 to 5 percent slopes. These somewhat poorly drained, very deep, nearly level to gently sloping soils are on uplands. Individual areas are generally irregular in shape and range from 3 to nearly 1,500 acres in size.

Typically, the surface layer of the Sparr soil is dark gray fine sand about 8 inches thick. The subsurface layer is light gray fine sand to a depth of about 45 inches and pale brown fine sand to a depth of 50 inches. The subsoil is light gray fine sandy loam to a depth of 80 inches or more.

Typically, the surface layer of the Lochloosa soil is dark grayish brown fine sand to a depth of about 3 inches and gray fine sand to a depth of about 8 inches. The subsurface layer is fine sand. It is dark grayish brown to a depth of about 14 inches, grayish brown to a depth of 25 inches, dark brown to a depth of 34 inches, and brown to a depth of 38 inches. The subsoil is light brownish gray fine sandy loam to a depth of 66 inches and light gray fine sandy loam to a depth of 80 inches or more.

Generally, the mapped areas average about 53 percent Sparr and similar soils and 33 percent Lochloosa and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Sparr and Lochloosa soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as Sparr-Lochloosa complex, 1 to 5 percent slopes, Sparr, Lochloosa, and similar soils make up about 75 to 97 percent of the mapped areas. Dissimilar soils make up about 3 to 25 percent. On 20 percent of the acreage, the dissimilar soils make up more than 25 percent of the mapped areas.

Included in mapping are soils that are similar to the Sparr soil but have a seasonal high water table at a depth of 42 to 72 inches. Also included are soils that are similar to the Lochloosa soil but have a seasonal high water table at a depth of 60 to 72 inches or 18 to 30 inches. Also included are soils that are similar to the Sparr and Lochloosa soils but have a dark, organically stained layer that overlies the subsoil; are sandy to a depth of more than 80 inches; have bedrock at a depth of 60 to 80 inches; have a dark surface layer that is more than 10 inches thick; or have sandy materials underlying the subsoil.

Dissimilar soils that are included with the Sparr and Lochloosa soils in mapping occur as small areas of Bivans, Bushnell, Ft. Green, Hicoria, Holopaw, Mabel, Micanopy, Moriah, and Popash soils. Bushnell, Bivans, Ft. Green, Mabel, Micanopy, and Moriah soils are in positions on the landscape similar to those of the Sparr and Lochloosa soils. Hicoria, Holopaw, and Popash soils are in depressions. Bushnell, Bivans, Mabel, and Micanopy soils have a loamy or clayey subsoil within a depth of 20 inches. Bivans and Ft. Green soils have a seasonal high water table within a depth of 18 inches. Bushnell, Mabel, and Moriah soils have limestone bedrock within a depth of 80 inches.

In most years the seasonal high water table is at a depth of 18 to 42 inches in the Sparr soil for 1 to 4 months and is at a depth of 30 to 60 inches in the Lochloosa soil for 1 to 3 months. Permeability is slow or moderately slow in the Sparr soil and slow in the

Lochloosa soil. Available water capacity is low in the Sparr soil and moderate in the Lochloosa soil.

Most areas of this map unit are used as pasture or cropland. Other areas are used for the production of pine trees or support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of laurel oak, live oak, slash pine, loblolly pine, longleaf pine, magnolia, sweetgum, hickory, and eastern redcedar in the overstory and cabbage-palm, blackberry, American beautyberry, greenbrier, saw palmetto, Florida holly, dogwood, bluestems, and panicums in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are moderately suited to cultivated crops. The main management concerns are seasonal wetness, which may delay planting; seasonal droughtiness caused by the low or moderate available water capacity; and low natural fertility. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. A well designed sprinkler irrigation system can help to maintain optimum soil moisture in the root zone during droughty periods. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth. Green manure crops, including grasses and legumes, should be used in the crop rotation.

These soils are well suited to pasture. The main management concern is the seasonal droughtiness and the low natural fertility. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is high. The main management concerns are the equipment limitation and plant competition caused by the seasonal wetness. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Site preparation should include removing the larger debris to facilitate mechanical operations and chopping the woody understory vegetation to reduce immediate plant competition. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility. A wide variety of trees, including slash pine and loblolly pine, grow well if properly managed.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

Sparr soils have moderate limitations on sites for residential and commercial buildings and local roads and streets because of wetness. Lochloosa soils have slight limitations on sites for residential and commercial buildings and local roads and streets. Installing a subsurface drainage system around the foundations of buildings and installing shallow ditches along roadsides can help to overcome these limitations. The wetness is a severe limitation on sites for septic tank absorption fields. Installing a filtering mound of suitable soil material generally can overcome this limitation. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic can help to overcome these limitations.

The capability subclass is IIIw for the Sparr soil and IIw for the Lochloosa soil. The woodland ordination symbol is 10W for the Sparr soil and 11A for the Lochloosa soil.

66—Levyville-Shadeville complex, 2 to 5 percent slopes. This map unit consists of a well drained, very deep Levyville soil and a moderately well drained, deep or very deep Shadeville soil. These gently sloping soils are on karst uplands. Individual areas are generally irregular in shape and range from 6 to 2,400 acres in size.

Typically, the surface layer of the Levyville soil is dark brown loamy fine sand about 8 inches thick. The subsoil is brown sandy clay loam to a depth of about 54 inches and dark yellowish brown sandy clay loam to a depth of 80 inches or more.

Typically, the surface layer of the Shadeville soil is dark grayish brown fine sand about 9 inches thick. The subsurface layer is brown fine sand to a depth of about 15 inches and yellowish brown fine sand to a depth of 26 inches. The subsoil is yellowish brown fine sandy loam to a depth of about 38 inches, yellowish brown sandy clay loam to a depth of 41 inches, and gray sandy clay to a depth of 63 inches. Limestone bedrock is at a depth of about 63 inches.

Generally, the mapped areas average about 61 percent Levyville and similar soils and 29 percent Shadeville and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Levyville and

Shadeville soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Levyville-Shadeville complex, 2 to 5 percent slopes, Levyville, Shadeville, and similar soils make up about 77 to 100 percent of the mapped areas. Dissimilar soils make up less than 23 percent. On 5 percent of the acreage, the dissimilar soils make up more than 23 percent of the mapped areas.

Included in mapping are soils that are similar to the Levyville soil but have a surface layer of fine sand or fine sandy loam that is more than 3 inches thick, have bedrock at a depth of 20 to 40 inches, have a seasonal high water table at a depth of 40 to 50 inches, have base saturation of more than 60 percent in the lower part of the subsoil, or contain an average of less than 18 percent clay in the upper 20 inches of the subsoil. Also included are soils that are similar to the Shadeville soil but have bedrock at a depth of 24 to 40 inches, do not have bedrock within a depth of 72 inches, have a surface layer of loamy fine sand, or do not have a seasonal high water table within a depth of 72 inches. Also included are soils that are similar to the Levyville and Shadeville soils but have a dark surface layer that is more than 10 inches thick or contain an average of more than 35 percent clay in the upper 20 inches of the subsoil.

Dissimilar soils that are included with the Levyville and Shadeville soils in mapping occur as small areas of Bushnell, Lutterloh, Mabel, Micanopy, Moriah, Otela, Pedro, and Tavares soils. Bushnell, Lutterloh, Mabel, Micanopy, Moriah, Otela, Pedro, and Tavares soils are in positions on the landscape similar to those of the Levyville and Shadeville soils. Bushnell, Lutterloh, Mabel, Micanopy, and Moriah soils are somewhat poorly drained. Lutterloh, Otela, and Tavares soils are sandy to a depth of 40 inches or more. Bushnell and Pedro soils have limestone bedrock within a depth of 40 inches.

The seasonal high water table is below a depth of 60 inches in the Levyville soil throughout the year and is perched at a depth of 48 to 72 inches in the Shadeville soil for 1 to 3 months during most years. Permeability is moderate in the Levyville soil and slow in the Shadeville soil. Available water capacity is moderate in both soils.

Most areas of this map unit are used as pasture or cropland. Other areas are used for residential development or the production of pine trees. Natural vegetation consists mainly of live oak, laurel oak, magnolia, loblolly pine, slash pine, eastern redcedar, and longleaf pine in the overstory and blackberry, pineland threeawn, greenbrier, American beautyberry, brackenfern, bluestems, and scattered cabbage-palm in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are well suited to cultivated crops. The main management concern is the hazard of erosion. Conservation practices, such as farming on the contour, applying a system of conservation tillage, and terracing, can minimize topsoil loss caused by erosion. Proper seedbed preparation, weed control, and applications of lime and fertilizer generally can assure high yields.

These soils are well suited to pasture. A wide variety of plants, including Pensacola bahiagrass and hairy indigo, grow well if properly managed. Proper stocking rates and pasture rotation generally are adequate to keep the pasture in good condition.

The potential productivity of these soils for pine trees is high. The main management concerns are the equipment limitation caused by the loose, sandy surface layer and plant competition. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation. A wide variety of trees, including slash pine, loblolly pine, and longleaf pine, grow well if properly managed.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

These soils have only slight limitations affecting sites for residential and commercial buildings and local roads and streets. Wetness, the restricted permeability in the subsoil, and the bedrock are moderate limitations on sites for septic tank absorption fields. Installing an oversized septic tank absorption field and taking care not to cluster homes and septic systems can help to overcome these limitations and minimize the hazard of ground-water pollution. The Shadeville soil has severe limitations on sites for most recreational facilities because of the loose, sandy surface layer. The Levyville soil has slight limitations on sites for most recreational facilities. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations.

The capability subclass is IIe for the Levyville soil and IIs for the Shadeville soil. The woodland ordination symbol is 11A for the Levyville soil and 11S for the Shadeville soil.

67—Immokalee, limestone substratum-Janney complex. This map unit consists of a deep or very deep Immokalee soil and a moderately deep Janney soil. These poorly drained, nearly level soils are on flatwoods. Individual areas are generally irregular in shape and range from 2 to 160 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Immokalee soil is very dark gray fine sand about 4 inches thick. The subsurface layer is gray fine sand to a depth of about 41 inches. The subsoil is very dark brown, organically coated fine sand to a depth of about 46 inches. The underlying material is light yellowish brown fine sand about 3 inches thick. Limestone bedrock is at a depth of about 49 inches.

Typically, the surface layer of the Janney soil is very dark gray fine sand about 8 inches thick. The subsurface layer is gray fine sand to a depth of about 14 inches and light gray fine sand to a depth of 20 inches. The subsoil is very dark brown fine sand to a depth of about 24 inches and very dark grayish brown fine sand to a depth of 27 inches. Limestone bedrock is at a depth of about 27 inches.

Generally, the mapped areas average about 47 percent Immokalee and similar soils and 40 percent Janney and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Immokalee and Janney soils and of the similar soils are fairly consistent in most mapped areas.

On 90 percent of the acreage mapped as Immokalee, limestone substratum-Janney complex, Immokalee, Janney, and similar soils make up about 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent. On 10 percent of the acreage, the dissimilar soils make up more than 20 percent of the mapped areas.

Included in mapping are soils that are similar to the Immokalee and Janney soils but have a loamy subsoil that overlies the bedrock, do not have bedrock within a depth of 72 inches, or do not have an organically coated subsoil within a depth of 50 inches. Also included are soils that are similar to the Janney soil but do not have a subsurface layer or have an organically coated subsoil at a depth of 30 to 38 inches.

Dissimilar soils that are included with the Immokalee and Janney soils in mapping occur as small areas of Aripeka, Bradenton, Broward, Hallandale, Hicoria, Lutterloh, Moriah, Placid, Popash, Seaboard, and Wekiva soils. Aripeka, Broward, Lutterloh, Moriah, and Seaboard soils are in the slightly higher landscape positions. Bradenton, Hallandale, and Wekiva soils are in positions on the landscape similar to those of the Immokalee and Janney soils. Hicoria, Placid, and Popash soils are in depressions. Bradenton and Wekiva soils have a loamy subsoil within a depth of 20 inches. Hallandale soils have limestone bedrock within a depth of 20 inches.

In most years the seasonal high water table is at a depth of 6 to 18 inches in the Immokalee and Janney soils for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is moderate or moderately rapid in the Immokalee soil and moderate in the Janney soil. Available water capacity is low in the Immokalee soil and very low in the Janney soil.

Most areas of this map unit are used as pasture. Other areas are used for cropland or the production of pine trees. Natural vegetation consists mainly of slash pine and scattered sweetgum in the overstory and saw palmetto, pineland threeawn, waxmyrtle, fetterbush, gallberry, bluestems, and scattered cabbage-palm in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

These soils are poorly suited to cultivated crops. Wetness during the growing season, occasional droughtiness, and low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during the growing season. Bedding is necessary for most row crops. A well designed sprinkler irrigation system can help to maintain optimum soil moisture during droughty periods. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

These soils are moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods or extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine,

reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility.

The wetness and the depth to bedrock are severe limitations on sites for septic tank absorption fields. Careful site investigation is needed to locate suitably large areas that are deep enough over bedrock. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. The wetness is a severe limitation affecting residential and commercial buildings, local roads and streets, and recreational facilities. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw. The woodland ordination symbol is 8W.

68—Myakka, limestone substratum-Immokalee complex. This map unit consists of a deep or very deep Myakka soil and a very deep Immokalee soil. These poorly drained, nearly level soils are on flatwoods. Individual areas are generally irregular in shape and range from 2 to nearly 800 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Myakka soil is very dark gray fine sand about 8 inches thick. The subsurface layer is gray fine sand to a depth of about 24 inches. The subsoil is very dark brown, organically coated fine sand to a depth of about 35 inches and dark brown fine sand to a depth of 40 inches. The underlying material is light yellowish brown fine sand. Limestone bedrock is at a depth of about 54 inches.

Typically, the surface layer of the Immokalee soil is very dark gray fine sand about 6 inches thick. The subsurface layer is gray fine sand to a depth of about 22 inches and light gray fine sand to a depth of 37 inches. The subsoil is black, organically coated fine sand to a depth of about 41 inches, dark brown fine sand to a depth of 54 inches, and dark brown fine sand to a depth of 70 inches. The underlying material is light yellowish brown fine sand to a depth of 80 inches or more.

Generally, the mapped areas average about 48 percent Myakka and similar soils and 40 percent Immokalee and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Myakka and Immokalee soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as Myakka, limestone substratum-Immokalee complex, Myakka, Immokalee, and similar soils make up about 78 to 100 percent of the mapped areas. Dissimilar soils make up less than 22 percent. On 20 percent of the acreage, the dissimilar soils make up more than 22 percent of the mapped areas.

Included in mapping are soils that are similar to the Myakka and Immokalee soils but have a loamy subsoil below a depth of 40 inches, do not have an organically coated subsoil within a depth of 50 inches, or have an organically coated subsoil within a depth of 20 inches. Also included are soils that are similar to the Myakka soil but have a dark surface layer that is more than 8 inches thick or do not have bedrock within a depth of 80 inches. Also included are soils that are similar to the Immokalee soil but have bedrock at a depth of 40 to 80 inches.

Dissimilar soils that are included with the Myakka and Immokalee soils in mapping occur as small areas of Boca, Bradenton, Broward, Hallandale, Hicoria, Janney, Lutterloh, Moriah, Pineda, Placid, Popash, and Seaboard soils. Broward, Lutterloh, Moriah, and Seaboard soils are in the slightly higher landscape positions. Boca, Bradenton, Hallandale, Janney, and Pineda soils are in positions on the landscape similar to those of the Myakka and Immokalee soils. Hicoria, Placid, and Popash soils are in depressions. Boca, Bradenton, Hallandale, and Pineda soils do not have an organically stained subsoil. Boca, Hallandale, and Janney soils have limestone bedrock within a depth of 40 inches.

In most years the seasonal high water table is at a depth of 6 to 18 inches in the Myakka and Immokalee soils for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is moderate or moderately rapid in the Myakka soil and moderate in the Immokalee soil. Available water capacity is low in both soils.

Most areas of this map unit are used as pasture. Other areas are used for cropland or the production of pine trees. Natural vegetation consists mainly of slash pine, longleaf pine, and scattered sweetgum in the overstory and saw palmetto, pineland threeawn, waxmyrtle, fetterbush, gallberry, bluestems, and scattered cabbage-palm in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

These soils are poorly suited to cultivated crops. Wetness during the growing season, occasional droughtiness, and low natural fertility are the main management concerns. Shallow surface ditches can be installed to remove excess water more rapidly during the growing season. Bedding is necessary for most row crops. A well designed sprinkler irrigation system can help to maintain optimum soil moisture during droughty periods. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

These soils are moderately suited to pasture. The wetness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods or extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, and plant competition caused by the wetness. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling mortality rate. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility.

The wetness is a severe limitation on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw. The woodland ordination symbol is 8W.

69—Broward-Lutterloh, limestone substratum, complex. This map unit consists of a moderately deep Broward soil and a very deep Lutterloh soil. These somewhat poorly drained, nearly level soils are on low ridges. Individual areas are generally irregular in shape and range from 2 to nearly 2,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Broward soil is dark gray fine sand about 6 inches thick. The underlying material is a mixture of light yellowish brown and brownish yellow fine sand to a depth of about 10 inches and yellowish brown fine sand to a depth of 25 inches. Limestone bedrock is at a depth of about 25 inches.

Typically, the surface layer of the Lutterloh soil is dark gray fine sand about 9 inches thick. The subsurface layer is light gray fine sand to a depth of about 35 inches and brown fine sand to a depth of 52 inches. The subsoil is light brownish gray fine sandy loam to a depth of 61 inches. Limestone bedrock is at a depth of about 61 inches.

Generally, the mapped areas average about 57 percent Broward and similar soils and 35 percent Lutterloh and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Broward and Lutterloh soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Broward-Lutterloh, limestone substratum, complex, Broward, Lutterloh, and similar soils make up about 87 to 98 percent of the mapped areas. Dissimilar soils make up about 2 to 13 percent. On 5 percent of the acreage, the dissimilar soils make up more than 13 percent of the mapped areas.

Included in mapping are soils that are similar to the Broward soil but have bedrock at a depth of 12 to 20 inches, have a loamy or organically stained subsoil that overlies the bedrock, or have bedrock at a depth of 40 to 60 inches. Also included are soils that are similar to the Lutterloh soil but are sandy to a depth of 80 inches or more, have an organically stained subsoil, have a dark surface layer that is more than 9 inches thick, or have bedrock at a depth of 40 to 60 inches.

Dissimilar soils that are included with the Broward and Lutterloh soils in mapping occur as small areas of

Boca, Bushnell, Hallandale, Hicoria, Holopaw, Placid, Pompano, Popash, Orsino, and Otela soils. Also included are soils that are in positions on the landscape similar to those of the Broward and Lutterloh soils but have bedrock within a depth of 12 inches. Bushnell soils are in positions on the landscape similar to those of the Broward and Lutterloh soils. Orsino and Otela soils are in the slightly higher landscape positions. Boca, Hallandale, Holopaw, and Pompano soils are in the slightly lower landscape positions. Hicoria, Placid, and Popash soils are in depressions. Bushnell soils have a clayey subsoil within a depth of 20 inches.

The seasonal high water table is at a depth of 18 to 30 inches in the Broward and Lutterloh soils for 2 to 6 months during most years. Permeability is rapid in the Broward soil and moderate in the Lutterloh soil. Available water capacity is very low in both soils.

Most areas of this map unit are used for pasture or the production of pine trees. Other areas have been subdivided for residential development. Natural vegetation consists mainly of live oak, slash pine, and loblolly pine in the overstory and pineland threeawn, saw palmetto, gallberry, blackberry, bluestems, running oak, cabbage-palm, and reindeer moss in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

These soils are poorly suited to cultivated crops. The main management concerns are seasonal wetness, which may delay planting; seasonal droughtiness caused by the very low available water capacity; and low natural fertility. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. A well designed sprinkler irrigation system can help to maintain optimum soil moisture in the root zone during droughty periods. Frequent applications of fertilizer and lime generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth. Green manure crops, including grasses and legumes, should be used in the crop rotation.

These soils are moderately suited to pasture. The main management concerns are the seasonal droughtiness and the low natural fertility. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are the equipment limitation and plant competition caused by the seasonal wetness and seedling mortality caused by the very low available water capacity and the low fertility. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Site preparation should include removing the larger debris to facilitate mechanical operations and chopping the woody understory vegetation to reduce immediate plant competition. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

Wetness is a moderate limitation affecting sites for residential and commercial buildings and local roads and streets. Installing a subsurface drainage system around the foundations of buildings and installing shallow ditches along roadsides can help to overcome this limitation. The wetness and the moderate depth to bedrock are severe limitations on sites for septic tank absorption fields. Careful site investigation is needed to locate suitably large areas that are deep enough over bedrock. Installing a filtering mound of suitable soil material can help to overcome the limitations. Limitations affecting recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic can help to overcome these limitations.

The capability subclass is IVw for the Broward soil and IIIw for the Lutterloh soil. The woodland ordination symbol is 9W for the Broward soil and 10W for the Lutterloh soil.

70—Hallandale-Boca-Holopaw complex. This map unit consists of a shallow or very shallow Hallandale soil, a moderately deep Boca soil, and a very deep Holopaw soil. These poorly drained, nearly level soils are on low ridges and flatwoods. Individual areas are generally irregular in shape and range from 2 to nearly 2,200 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Hallandale soil is light gray fine sand about 4 inches thick. The subsurface layer is white fine sand to a depth of about 12 inches. The subsoil is very pale brown fine sand to a depth of 19 inches. Limestone bedrock is at a depth of about 19 inches.

Typically, the surface layer of the Boca soil is dark gray fine sand about 4 inches thick. The subsurface layer is white fine sand to a depth of about 10 inches and very pale brown fine sand to a depth of 21 inches. The subsoil is light brownish gray sandy clay loam to a

depth of about 25 inches. Limestone bedrock is at a depth of about 25 inches.

Typically, the surface layer of the Holopaw soil is very dark gray fine sand about 4 inches thick. The subsurface layer is light gray fine sand to a depth of about 28 inches and very pale brown fine sand to a depth of 52 inches. The subsoil is gray sandy clay loam to a depth of 80 inches or more.

Generally, the mapped areas average about 35 percent Hallandale and similar soils, 28 percent Boca and similar soils, and 27 percent Holopaw and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Hallandale, Boca, and Holopaw soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as Hallandale-Boca-Holopaw complex, Hallandale, Boca, Holopaw, and similar soils make up about 75 to 100 percent of the mapped areas. Dissimilar soils make up less than 25 percent. On 20 percent of the acreage, the dissimilar soils make up more than 25 percent of the mapped areas.

Included in mapping are soils that are similar to the Hallandale soil but have a continuous, loamy subsoil that overlies the bedrock; have a dark surface layer that is more than 7 inches thick; or have bedrock within a depth of 4 inches. Also included are soils that are similar to the Boca soil but do not have a loamy subsoil at least 4 inches thick, have a loamy subsoil within a depth of 20 inches, or have bedrock at a depth of 40 to 80 inches. Also included are soils that are similar to the Holopaw soil but have bedrock at a depth of 40 to 80 inches, have a dark surface layer that is more than 7 inches thick, or do not have a loamy subsoil within a depth of 80 inches. Also included are soils that are similar to the Hallandale, Boca, and Holopaw soils but have a dark, organically stained subsoil that is more than 2 inches thick.

Dissimilar soils that are included with the Hallandale, Boca, and Holopaw soils in mapping occur as small areas of Adamsville, Broward, Hicoria, Lutterloh, Moriah, Placid, Popash, and Seaboard soils. Also included are small areas of rock outcrop. Hicoria, Placid, and Popash soils are in depressions. Adamsville, Broward, Lutterloh, Moriah, and Seaboard soils are in the slightly higher landscape positions.

In most years the seasonal high water table is within a depth of 12 inches in the Hallandale, Boca, and Holopaw soils for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is rapid in the Hallandale soil, moderate in the Boca soil, and moderately slow or moderate in the Holopaw soil. Available water capacity is very low in the Hallandale and Boca soils and low in the Holopaw soil.

Most areas of this map unit are used for pasture or the production of pine trees. Natural vegetation consists mainly of slash pine, loblolly pine, sweetgum, laurel oak, and cabbage-palm in the overstory and bluestems, blackberry, poison ivy, hatpin, gallberry, waxmyrtle, fetterbush, maidencane, and scattered saw palmetto in the understory. This map unit generally is in the North Florida Flatwoods ecological community *(24)*.

These soils are poorly suited to cultivated crops. The main management concerns are the shallowness to bedrock, low natural fertility, and wetness, which may delay planting. Bedding and installing surface ditches generally are needed if row crops are grown, but special equipment may be needed because of the limited depth to bedrock. During droughty periods, the water table is below the bedrock, and thus sufficient moisture is not available to plant roots. Special cultivation equipment may be needed because of the limited depth to bedrock. Proper seedbed preparation and weed control are needed to control competing vegetation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

These soils are moderately suited to pasture. The wetness, a thin root zone, and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Shallow surface ditches can help to remove excess water more rapidly during wet periods, but special equipment may be needed because of the limited depth to bedrock. During droughty periods, the water table is below the bedrock, and thus sufficient moisture is not available to plant roots. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Restricting grazing during very wet periods or extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderate. The main management concerns are the equipment limitation, seedling mortality, plant competition, and windthrow, which is caused by the wetness and the shallowness to bedrock. Site preparation should include removing the larger debris to facilitate mechanical operations, chopping the woody understory vegetation to reduce immediate plant competition, and bedding to reduce the seedling

mortality rate. Shallow surface ditches can be installed to remove excess water more rapidly during wet periods. Because of the shallowness to bedrock, specialized equipment may be needed for proper site preparation and tree planting activities. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Planting adapted trees, such as slash pine, reduces the seedling mortality rate. Prescribed burning and controlled grazing in established stands help to control competing vegetation and to maintain accessibility. Thinning the hardwood overstory instead of clearcutting or leaving some rows of unharvested trees as windbreaks reduces the hazard of windthrow. During harvest, site preparation, and road-building activities, the flow of the creeks and drainageways that remove excess water from the area should not be impeded.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

The wetness and the depth to bedrock are severe limitations on sites for septic tank absorption fields, residential and commercial buildings, local roads and streets, and recreational facilities. Careful site investigation is needed to locate suitably large areas that are deep enough over bedrock. Installing a filtering mound of suitable soil material can help to overcome the limitations affecting septic tank absorption fields. Filling, which raises building foundations above the level of the seasonal wetness, can help to overcome the limitations affecting residential and commercial buildings. Raising road bases above the level of the seasonal wetness and installing a system of roadside ditches and culverts can help to overcome the limitations affecting local roads and streets; however, the installation of ditches may require the use of special equipment because of the shallowness to bedrock. Restricting access during wet periods and establishing species of turf grass that are tolerant of wetness and traffic can help to overcome the limitations affecting recreational uses.

The capability subclass is IVw for the Hallandale and Holopaw soils and IIIw for the Boca soil. The woodland ordination symbol is 8W for the Hallandale and Boca soils and 10W for the Holopaw soil.

71—Pender loamy fine sand. This somewhat poorly drained, very deep, nearly level soil is on uplands. It occurs as one area that is irregular in shape and is nearly 1,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark grayish brown loamy fine sand about 9 inches thick. The subsurface layer is dark grayish brown loamy fine sand to a depth of about 14 inches. The subsoil is sandy clay loam. It is yellowish brown to a depth of about 18 inches, brownish yellow to a depth of 48 inches, and gray to a depth of 58 inches. The underlying material is light gray sandy clay loam to a depth of 80 inches or more.

On 90 percent of the acreage mapped as Pender loamy fine sand, Pender and similar soils make up about 75 to 94 percent of the mapped areas. Dissimilar soils make up about 6 to 25 percent. On 10 percent of the acreage, the dissimilar soils make up more than 25 percent of the mapped areas.

Included in mapping are soils that are similar to the Pender soil but have a seasonal high water table at a depth of 30 to 60 inches, contain less than 18 percent clay in the upper 20 inches of the subsoil, have average content of clay in the upper part of the subsoil that is less than twice that of the overlying layer, have a subsoil that does not have mottles in shades of gray within the upper 10 inches, have a strong brown or reddish yellow subsoil that does not decrease in content of clay by as much as 20 percent within a depth of 60 inches, have bedrock at a depth of 60 to 80 inches, have a surface layer of fine sand or fine sandy loam, have a subsurface layer of fine sand, or have a loamy subsoil at a depth of 20 to 40 inches.

Dissimilar soils that are included with the Pender soil in mapping occur as small areas of Bradenton, Bushnell, Hague, Hicoria, Levyville, Mabel, Pineda, Popash, and Sparr soils. Hague and Levyville soils are in the slightly higher landscape positions. Bushnell, Mabel, and Sparr soils are in positions on the landscape similar to those of the Pender soil. Bradenton and Pineda soils are in the slightly lower landscape positions. Hicoria and Popash soils are in depressions. Bushnell and Mabel soils have a clayey subsoil and have limestone bedrock within a depth of 80 inches. Sparr soils are sandy to a depth of 40 to 80 inches.

In most years the seasonal high water table is at a depth of 18 to 30 inches in the Pender soil for 1 to 3 months, but it can recede to a depth of about 60 inches during droughty periods. Permeability is moderate. Available water capacity is moderate.

Most areas of this map unit are used for pasture or the production of nursery stock. Other areas are used for the production of pine trees or support natural vegetation and are used only as wildlife habitat. Natural vegetation consists mainly of live oak, laurel oak, magnolia, sweetgum, loblolly pine, slash pine, cedar, and longleaf pine in the overstory and blackberry, pineland threeawn, greenbrier, American beautyberry,

brackenfern, bluestems, and scattered cabbage-palm and saw palmetto in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

This soil is moderately suited to cultivated crops. The main management concern is seasonal wetness, which may delay planting. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. Proper seedbed preparation, weed control, and applications of lime and fertilizer generally can assure high yields.

This soil is well suited to pasture. A wide variety of plants, including Pensacola bahiagrass and hairy indigo, grow well if properly managed. Proper stocking rates and pasture rotation generally are adequate to keep the pasture in good condition.

The potential productivity of this soil for pine trees is high. The main management concerns are the equipment limitation and plant competition caused by the seasonal wetness. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Site preparation should include removing the larger debris to facilitate mechanical operations and chopping the woody understory vegetation to reduce immediate plant competition. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility. A wide variety of trees, including slash and loblolly pine, grow well if properly managed.

The seasonal wetness is a moderate limitation affecting sites for residential and commercial buildings and local roads and streets. Installing a subsurface drainage system around the foundations of buildings and installing shallow ditches along roadsides can help to overcome this limitation. The wetness is a severe limitation on sites for septic tank absorption fields. Installing a filtering mound of suitable soil material generally can overcome this limitation. Limitations affecting recreational facilities are moderate because of the seasonal wetness. Establishing species of turf grass that are tolerant of traffic and restricting access during wet periods can help to overcome these limitations.

The capability class is IIw. The woodland ordination symbol is 11W.

72—Levyville-Hague complex. These well drained, very deep, nearly level soils are on uplands. Individual areas are generally irregular in shape and range from 35 to nearly 2,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Levyville soil is dark grayish brown fine sand about 4 inches thick. The subsurface layer is brown fine sand to a depth of about 15 inches. The subsoil is strong brown sandy clay loam to a depth of about 30 inches, strong brown fine sandy loam to a depth of 55 inches, and a mixture of strong brown and brownish yellow loamy fine sand to a depth of 65 inches. The underlying material is white fine sand to a depth of 80 inches or more.

Typically, the surface layer of the Hague soil is dark grayish brown fine sand about 7 inches thick. The subsurface layer is yellowish brown fine sand to a depth of about 24 inches. The subsoil is yellowish brown sandy clay loam to a depth of about 36 inches, a mixture of yellowish brown and brownish yellow fine sandy loam to a depth of 50 inches, and a mixture of yellowish brown and brownish yellow loamy fine sand to a depth of 60 inches. The underlying material is very pale brown fine sand to a depth of 80 inches or more.

Generally, the mapped areas average about 61 percent Levyville and similar soils and 35 percent Hague and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Levyville and Hague soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Levyville-Hague complex, Levyville, Hague, and similar soils make up about 87 to 100 percent of the mapped areas. Dissimilar soils make up less than 13 percent. On 5 percent of the acreage, the dissimilar soils make up more than 13 percent of the mapped areas.

Included in mapping are soils that are similar to the Levyville soil but have a surface layer of loamy fine sand or fine sandy loam, have a seasonal high water table at a depth of 40 to 60 inches, have base saturation of more than 60 percent in the lower part of the subsoil, or contain less than 18 percent clay in the upper 20 inches of the subsoil. Also included are soils that are similar to the Hague soil but have a seasonal high water table at a depth of 40 to 72 inches. Also included are soils that are similar to the Levyville and Hague soils but that have base saturation of less than 35 percent in the lower part of the subsoil, that have limestone below a depth of 60 inches, or in which the content of clay in the subsoil does not decrease by as much as 20 percent within a depth of 60 inches.

Dissimilar soils that are included with the Levyville and Hague soils in mapping occur as small areas of Adamsville, Candler, Hicoria, Lochloosa, Millhopper, Otela, Pender, Placid, Popash, Sparr, and Tavares soils. Candler, Millhopper, Otela, and Tavares soils are in positions on the landscape similar to those of the Levyville and Hague soils. Adamsville, Lochloosa, Pender, and Sparr soils are in the slightly lower

landscape positions. Hicoria, Placid, and Popash soils are in depressions. Candler, Millhopper, Otela, and Tavares soils are sandy to a depth of 40 inches or more.

Throughout the year, the seasonal high water table is below a depth of 60 inches in the Levyville soil and below a depth of 72 inches in the Hague soil. Permeability is moderate in both soils. Available water capacity is moderate.

Most areas of this map unit are used for pasture or the production of nursery stock. Natural vegetation consists mainly of live oak, laurel oak, magnolia, loblolly pine, slash pine, cedar, and longleaf pine in the overstory and blackberry, pineland threeawn, greenbrier, dogwood, American beautyberry, brackenfern, bluestems, and scattered cabbage-palm in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

These soils are well suited to cultivated crops. Proper seedbed preparation, weed control, and applications of lime and fertilizer generally can assure high yields. Returning crop residue to the soil and using a cropping system that includes grasses and legumes can help to maintain the content of organic matter and improve tilth.

These soils are well suited to pasture. A wide variety of plants, including Pensacola bahiagrass and hairy indigo, grow well if properly managed. Proper stocking rates and pasture rotation generally are adequate to keep the pasture in good condition.

The potential productivity of these soils for pine trees is high. The main management concern is plant competition. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation. A wide variety of trees, including slash pine, loblolly pine, and longleaf pine, grow well if properly managed.

The individual components of this map unit may differ somewhat in the characteristics that affect woodland management. See table 7 for more detailed information regarding each component.

These soils have only slight limitations affecting sites for residential and commercial buildings and local roads and streets. Levyville soils have moderate limitations on sites for septic tank absorption fields because of the moderate permeability in the subsoil and seasonal wetness. Hague soils have slight limitations on sites for septic tank absorption fields. Installing an oversized septic tank absorption field and taking care not to cluster homes and septic systems can help to overcome these limitations and minimize the hazard of ground-water pollution. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations.

The capability class is I for the Levyville soil and IIs for the Hague soil. The woodland ordination symbol is 11A for both soils.

73—Orlando fine sand, 1 to 5 percent slopes. This well drained, very deep, nearly level and gently undulating soil is on uplands. Individual areas are generally irregular in shape and range from 2 to nearly 5,200 acres in size.

Typically, the surface layer is very dark gray fine sand about 11 inches thick. The underlying material is fine sand. It is dark brown to a depth of about 28 inches, dark yellowish brown to a depth of 34 inches, strong brown to a depth of 72 inches, and light yellowish brown to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Orlando fine sand, 1 to 5 percent slopes, Orlando and similar soils make up about 91 to 100 percent of the mapped areas. Dissimilar soils make up less than 9 percent. On 5 percent of the acreage, the dissimilar soils make up more than 9 percent of the mapped areas.

Included in mapping are soils that are similar to the Orlando soil but do not have a dark surface layer more than 10 inches thick, have slopes of more than 5 percent, or contain less than 5 percent or more than 10 percent silt and clay between depths of 10 and 40 inches.

Dissimilar soils that are included with the Orlando soil in mapping occur as small areas of Adamsville, Apopka, Bonneau, Millhopper, Placid, Popash, Sparr, and Tavares soils. Apopka, Bonneau, Millhopper, and Tavares soils are in positions on the landscape similar to those of the Orlando soil. Adamsville and Sparr soils are in the slightly lower landscape positions. Placid and Popash soils are in depressions. Apopka, Bonneau, and Millhopper soils have a loamy subsoil within a depth of 80 inches. Bonneau, Millhopper, and Tavares soils are moderately well drained.

The seasonal high water table is below a depth of 72 inches in the Orlando soil throughout the year. Permeability is rapid. Available water capacity is low.

Most areas of this map unit are used as pasture or cropland. Other areas are used for residential development or the production of pine trees. Natural vegetation consists mainly of live oak, laurel oak, bluejack oak, loblolly pine, slash pine, longleaf pine, and scattered turkey oak in the overstory and blackberry, pineland threeawn, Spanish bayonet, brackenfern, bluestems, and scattered saw palmetto in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

This soil is moderately suited to cultivated crops. Droughtiness and soil blowing are the main

management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. In some areas, however, irrigation may be impractical because of a lack of water. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing. Occasional applications of lime and fertilizer generally are adequate to maintain fertility.

This soil is well suited to pasture. Droughtiness is the main management concern. It limits the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Pastures should be established or renovated during the wetter months. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are seedling mortality caused by the seasonal droughtiness; the equipment limitation caused by the loose, sandy surface layer; and, in some areas, plant competition. Planting adapted trees, such as slash pine, and planting during the wetter months reduce the seedling mortality rate. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

This soil has only slight limitations affecting sites for septic tank absorption fields, residential and commercial buildings, and local roads and streets. Taking care not to cluster homes and septic systems minimizes the hazard of ground-water pollution. Limitations affecting most recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations. Applications of mulch, applications of fertilizer, and irrigation generally are needed to establish turf grasses.

The capability subclass is IIIs. The woodland ordination symbol is 10S.

74—Arents, 0 to 5 percent slopes. These are moderately well drained, deep or very deep, nearly level to gently sloping soils. Individual areas are generally angular and elongated and range from 3 to nearly 200 acres in size.

These soils consist of fill material that has been excavated from nearby pits or canals. In many areas, the soil material has been redistributed and smoothed in order to accommodate roads and airport runways. Arents generally consist of a heterogeneous mixture of sandy soil material, loamy pockets and lenses that were formerly part of the subsoil of nearby soils, and gravel- to boulder-sized fragments of hard and soft limestone. They do not have an orderly sequence of soil layers but are a variable mixture of lenses, pockets, and fragments that occur within very short distances. Depth of the fill material ranges from about 20 to 60 inches. Beneath the fill material is the original soil or limestone bedrock.

Included in mapping are small areas of soils that are similar to the Arents but are less than 20 inches deep over the original soil or bedrock and deep piles of fill material that have slopes of more than 5 percent. These included areas generally make up less than 20 percent of most mapped areas.

Many areas of this map unit are used for roads, runways, or commercial and residential buildings. Most areas have been stabilized with lawn grasses, but some areas are bare or are only sparsely vegetated.

Present land uses generally preclude the use of these soils for cropland, pasture, or the production of pine trees.

These soils have slight limitations affecting sites for residential and commercial buildings, local roads and streets, and recreational facilities. The slow to moderate permeability and some seasonal wetness are severe limitations on sites for septic tank absorption fields. Backfilling trenches with more suitable soil material and installing an oversize septic tank absorption field can help to overcome these limitations.

The capability subclass is VIs. No woodland ordination symbol is assigned.

75—Orlando fine sand, 5 to 8 percent slopes. This well drained, very deep, gently rolling soil is on uplands.

Typically, the surface layer is very dark gray fine sand about 11 inches thick. The underlying material is fine sand. It is dark brown to a depth of about 28 inches, dark yellowish brown to a depth of 34 inches, strong brown to a depth of 72 inches, and light yellowish brown to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Orlando fine sand, 5 to 8 percent slopes, Orlando and similar soils make up about 91 to 100 percent of the mapped areas. Dissimilar soils make up less than 9 percent. On 5 percent of the acreage, the dissimilar soils make up more than 9 percent of the mapped areas.

Included in mapping are soils that are similar to the Orlando soil but do not have a dark surface layer more than 10 inches thick or have less than 5 percent or

more than 10 percent silt and clay between depths of 10 and 40 inches. Also included are small areas of soils that are similar to the Orlando soil but have slopes of more than 8 percent or less than 5 percent.

Dissimilar soils that are included with the Orlando soil in mapping occur as small areas of Adamsville, Apopka, Bonneau, Millhopper, Placid, Popash, Sparr, and Tavares soils. Apopka, Bonneau, Millhopper, and Tavares soils are in positions on the landscape similar to those of the Orlando soil. Adamsville and Sparr soils are in the slightly lower landscape positions. Placid and Popash soils are in depressions. Apopka, Bonneau, and Millhopper soils have a loamy subsoil within a depth of 80 inches. Bonneau, Millhopper, and Tavares soils are moderately well drained.

The seasonal high water table is below a depth of 72 inches in the Orlando soil throughout the year. Permeability is rapid. Available water capacity is low.

Most areas of this map unit are used as pasture or cropland. Other areas are used for residential development or the production of pine trees. Natural vegetation consists mainly of live oak, laurel oak, bluejack oak, loblolly pine, longleaf pine, and scattered turkey oak in the overstory and blackberry, pineland threeawn, Spanish bayonet, brackenfern, bluestems, and scattered saw palmetto in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

This soil is moderately suited to cultivated crops. The main management concerns are droughtiness, soil blowing, and the hazard of erosion. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. In many areas, however, irrigation may be impractical because of an insufficient supply of water, or the system may be difficult to install because of the slope. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing. Farming on the contour and applying a system of conservation tillage can minimize soil erosion caused by runoff. Occasional applications of lime and fertilizer generally are adequate to maintain fertility.

This soil is well suited to pasture. The droughtiness is the main management concern. It limits the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Pastures should be established or renovated during the wetter months. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates and pasture rotation help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are seedling mortality caused by the seasonal droughtiness; the equipment limitation caused by the loose, sandy surface layer; and, in some areas, plant competition. Planting adapted trees, such as slash pine, and planting during the wetter months reduce the seedling mortality rate. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility.

This soil has slight limitations affecting sites for septic tank absorption fields, residential buildings, and local roads and streets. Taking care not to cluster homes and septic systems minimizes the hazard of ground-water pollution. Limitations affecting commercial buildings are moderate because of the slope. Limitations affecting recreational facilities are severe because of the loose, sandy surface layer. Establishing species of turf grass that are tolerant of traffic and restricting access to stabilized areas can help to overcome these limitations. Applications of mulch, applications of fertilizer, and irrigation generally are needed to establish turf grasses.

The capability subclass is IVs. The woodland ordination symbol is 10S.

76—Astatula fine sand, 1 to 8 percent slopes. This excessively drained, very deep, nearly level to gently rolling soil is on uplands. Individual areas are generally irregular in shape and range from 10 to nearly 6,000 acres in size.

Typically, the surface layer is dark gray fine sand to a depth of about 5 inches. The underlying material is yellow fine sand to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Astatula fine sand, 1 to 8 percent slopes, Astatula and similar soils make up about 96 to 100 percent of the mapped areas. Dissimilar soils make up less than 4 percent. On 5 percent of the acreage, the dissimilar soils make up more than 4 percent of the mapped areas.

Included in mapping are soils that are similar to the Astatula soil but have more than 5 percent silt and clay in the 10- to 40-inch control section, have lamellae within a depth of 80 inches, or have a dark surface layer that is more than 7 inches thick. Also included are small areas of soils that are similar to the Astatula soil but have slopes of more than 8 percent.

Dissimilar soils that are included with the Astatula soil in mapping occur as small areas of Adamsville, Apopka, Millhopper, Placid, Popash, Sparr, and Tavares

soils and soils in pits and dumps. Apopka and Millhopper soils are in positions on the landscape similar to those of the Astatula soil. Adamsville, Sparr, and Tavares soils are in the slightly lower landscape positions. Placid and Popash soils are in depressions. Apopka and Millhopper soils have a loamy subsoil at depths of 40 to 80 inches.

The seasonal high water table is below a depth of 72 inches in the Astatula soil throughout the year. Permeability is very rapid. Available water capacity is very low.

Most areas of this map unit are idle and are used only as wildlife habitat. Some areas are used for pasture or the production of pine trees or have been subdivided for residential development. Natural vegetation consists mainly of turkey oak, live oak, bluejack oak, and longleaf pine in the overstory and wiregrass, bluestems, blackberry, Spanish bayonet, Florida rosemary, and scattered saw palmetto in the understory. This map unit generally is in the Longleaf Pine-Turkey Oak Hills ecological community *(24)*.

This soil is very poorly suited to cultivated crops. Prolonged droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. In many areas, however, irrigation may be impractical because of an insufficient supply of water, or the system may be difficult to install because of the slope. Returning crop residue to the soil and mulching can increase the content of organic matter and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

This soil is poorly suited to pasture. The prolonged droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Pastures should be established or renovated during the wetter months. Restricting grazing during dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is low. The main management concerns are seedling mortality caused by the prolonged droughtiness and the low fertility and the equipment limitation caused by the loose, sandy surface layer. Planting adapted trees, such as sand pine, and planting during the wetter months reduce the seedling mortality rate. Establishing a close-growing cover crop before planting can help to stabilize the sandy surface layer, improve trafficability, and increase the available water capacity of the topsoil. Using harvesting and planting machinery equipped with large rubber tires helps to overcome the equipment limitation.

This soil has slight limitations affecting sites for septic tank absorption fields, residential buildings, and local roads and streets. Taking care not to cluster homes and septic systems minimizes the hazard of ground-water pollution. In areas that have slopes of more than 5 percent, the slope is a moderate limitation affecting sites for commercial buildings. Limitations affecting recreational facilities are severe because of the loose, sandy surface layer. Establishing turf grasses that are tolerant of droughtiness and traffic can help to stabilize the surface layer. Applications of mulch, applications of fertilizer, frequent irrigation, and restricted access are generally required.

The capability subclass is VIs. The woodland ordination symbol is 3S.

77—Candler fine sand, 5 to 8 percent slopes. This excessively drained, very deep, gently rolling soil is on uplands. Individual areas are generally irregular in shape and range from 3 to nearly 500 acres in size.

Typically, the surface layer is dark grayish brown fine sand about 6 inches thick. The subsurface layer is very pale brown fine sand to a depth of about 60 inches. A mixed subsurface layer and subsoil to a depth of 80 inches or more is very pale brown fine sand that has common thin, horizontal yellowish brown lamellae.

On 80 percent of the acreage mapped as Candler fine sand, 5 to 8 percent slopes, Candler and similar soils make up about 78 to 97 percent of the mapped areas. Dissimilar soils make up about 3 to 22 percent. On 20 percent of the acreage, the dissimilar soils make up more than 22 percent of the mapped areas.

Included in mapping are soils that are similar to the Candler soil but have more than 5 percent silt and clay in the 10- to 40-inch control section, do not have lamellae within a depth of 80 inches, have a seasonal high water table at a depth of 40 to 72 inches, or have a dark surface layer that is more than 7 inches thick. Also included are small areas of soils that are similar to the Candler soil but have slopes of more than 8 percent or less than 5 percent.

Dissimilar soils that are included with the Candler soil in mapping occur as small areas of Adamsville, Apopka, Millhopper, Placid, Popash, and Sparr soils and soils in pits and dumps. Apopka and Millhopper soils are in

positions on the landscape similar to those of the Candler soil. Sparr and Adamsville soils are in the slightly lower landscape positions. Placid and Popash soils are in depressions. Apopka and Millhopper soils have a loamy subsoil at depths of 40 to 80 inches.

The seasonal high water table is below a depth of 72 inches in the Candler soil throughout the year. Permeability is rapid. Available water capacity is very low.

Most areas of this map unit are idle and are used only as wildlife habitat. Other areas are used for pasture, cropland, or the production of pine trees or have been subdivided for residential development. Natural vegetation consists mainly of turkey oak, live oak, bluejack oak, and longleaf pine in the overstory and wiregrass, bluestems, blackberry, Spanish bayonet, Florida rosemary, and scattered saw palmetto in the understory. This map unit generally is in the Longleaf Pine-Turkey Oak Hills ecological community *(24)*.

This soil is poorly suited to cultivated crops. Prolonged droughtiness, low natural fertility, and soil blowing are the main management concerns. A well designed sprinkler irrigation system is necessary to maintain adequate soil moisture during the growing season for most cultivated crops. In many areas, however, irrigation may be impractical because of an insufficient supply of water, or the system may be difficult to install because of the slope. Returning crop residue to the soil and mulching can increase the content of organic matter content and the water-holding capacity of the topsoil. Green manure crops, including grasses and legumes, should be used in the crop rotation. Frequent applications of lime and fertilizer generally are needed to improve and maintain fertility. Establishing windbreaks around fields and utilizing field windstrips with row crops can minimize loss of topsoil and damage to emergent plants caused by soil blowing.

This soil is poorly suited to pasture. The prolonged droughtiness and the low natural fertility are the main management concerns. They limit the selection of plant species and the periods of grazing. Adapted plants, such as Pensacola bahiagrass and hairy indigo, grow well if properly managed. Pastures should be established or renovated during the wetter months. Restricting grazing during extended dry periods helps to prevent damage to plant roots. Proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture in good condition.

The potential productivity of this soil for pine trees is moderate. The main management concerns are the very low available water capacity in the root zone, the prolonged droughtiness, and the loose sandy surface layer, which result in an equipment limitation and seedling mortality and limit the selection of trees that can be planted. Planting adapted trees, such as sand pine, and planting during the wetter months reduce the seedling mortality rate. Establishing a close-growing cover crop before planting can help to stabilize the sandy surface, improve trafficability, and increase the available water capacity of the topsoil.

This soil has slight limitations affecting sites for septic tank absorption fields, residential buildings, and local roads and streets. Taking care not to cluster homes and septic systems minimizes the hazard of ground-water pollution. Limitations affecting commercial buildings are moderate because of the slope. Limitations affecting recreational facilities are severe because of the loose, sandy surface layer. Establishing turf grasses that are tolerant of droughtiness and traffic can help to stabilize the surface layer. Applications of mulch, applications of fertilizer, frequent irrigation, and restricted access are generally required.

The capability subclass is VIs. The woodland ordination symbol is 8S.

78—Micanopy loamy fine sand, 1 to 5 percent slopes. This somewhat poorly drained, very deep, nearly level to gently sloping soil is on uplands. Individual areas are generally irregular in shape and range from 5 to nearly 600 acres in size.

Typically, the surface layer is very dark grayish brown loamy fine sand about 7 inches thick. The subsoil is yellowish brown sandy clay to a depth of about 15 inches, brown sandy clay to a depth of 21 inches, grayish brown sandy clay to a depth of 37 inches, gray sandy clay to a depth of 56 inches, mixed grayish brown and light gray sandy clay loam to a depth of 68 inches, and gray clay to a depth of 80 inches or more.

On 80 percent of the acreage mapped as Micanopy loamy fine sand, 1 to 5 percent slopes, Micanopy and similar soils make up about 76 to 89 percent of the mapped areas. Dissimilar soils make up about 11 to 24 percent. On 20 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Micanopy soil but have limestone bedrock between depths of 20 and 80 inches, have a surface layer of fine sand or fine sandy loam, have a sandy epipedon that is 20 to 40 inches thick, have a dark surface layer that is more than 8 inches thick, have a high water table that is perched at a depth of 12 to 18 inches or between depths of 30 and 60 inches, contain more than 60 percent clay or less than 35 percent clay in the upper 20 inches of the subsoil, have more than 5 percent gravel- to boulder-sized limestone or chert fragments at the surface or within the solum, or have base saturation of less than 35 percent in the lower part of the subsoil.

Dissimilar soils that are included with the Micanopy soil in mapping are small areas of Broward, Ft. Green, Hicoria, Jonesville, Lutterloh, Otela, Pedro, Seaboard, Sparr, and Tavares soils. Broward, Ft. Green, Jonesville, Lutterloh, Otela, Pedro, Seaboard, Sparr, and Tavares soils are in positions on the landscape similar to those of the Micanopy soil. Hicoria soils are in depressions. Broward, Jonesville, Pedro, and Seaboard soils have limestone bedrock within a depth of 40 inches. Jonesville, Pedro, and Seaboard soils are better drained than the Micanopy soil. Ft. Green soils are poorly drained and are sandy to depths of 20 to 40 inches. Lutterloh, Otela, Sparr, and Tavares soils are sandy to a depth of 40 inches or more. Otela and Tavares soils are better drained than the Micanopy soil.

The seasonal high water table is perched at a depth of 18 to 30 inches in the Micanopy soil for 1 to 3 months during most years. Permeability is slow. Available water capacity is moderate.

Most areas of this map unit are used as pasture or cropland. Other areas are used for residential development or the production of pine trees. Natural vegetation consists mainly of laurel oak, live oak, water oak, magnolia, sweetgum, hickory, slash pine, loblolly pine, longleaf pine, and eastern redcedar in the overstory and blackberry, American beautyberry, greenbrier, brackenfern, Florida holly, bluestems, panicums, dogwood, saw palmetto, and scattered cabbage-palm in the understory. This map unit generally is in the Upland Hardwood Hammocks ecological community *(24)*.

This soil is moderately suited to cultivated crops. The main management concerns are seasonal wetness, which may delay planting, and the hazard of erosion. Shallow surface ditches and grassed waterways can help to remove excess water during wet periods. Conservation practices, such as farming on the contour, applying a system of conservation tillage, and terracing, can minimize topsoil loss caused by erosion. Proper seedbed preparation, weed control, and applications of lime and fertilizer generally can assure high yields.

This soil is well suited to pasture. A wide variety of plants, including Pensacola bahiagrass and hairy indigo, grow well if properly managed. Proper stocking rates and pasture rotation generally are adequate to keep the pasture in good condition.

The potential productivity of this soil for pine trees is high. The main management concerns are the equipment limitation and plant competition caused by the seasonal wetness. Limiting mechanical operations to the drier periods reduces the equipment limitation and usually results in less soil compaction and damage to roots during thinning operations. Site preparation should include removing the larger debris to facilitate mechanical operations and chopping and burning the woody understory vegetation to reduce immediate plant competition. Prescribed burning and controlled grazing in established stands generally are adequate to control competing vegetation and to maintain accessibility. A wide variety of trees, including slash pine and loblolly pine, grow well if properly managed.

Wetness and the slow permeability in the subsoil are severe limitations on sites for septic tank absorption fields. Installing a filtering mound of suitable soil material can help to overcome these limitations. The shrink-swell potential in the subsoil is a severe limitation on sites for residential and commercial buildings and local roads and streets. Constructing buildings with a reinforced foundation or a floating slab can help to overcome the limitations affecting buildings and minimizes the hazard of foundation and wall cracking. The wetness and the slow permeability are moderate limitations affecting most recreational facilities. Establishing species of turf grass that are tolerant of traffic and restricting access during wet periods can help to overcome these limitations.

The capability subclass is IIw. The woodland ordination symbol is 11A.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern that is in harmony with nature.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Anthony Drew, Florida Cooperative Extension Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Natural Resources Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

According to the Levy County Cooperative Extension Service, approximately 108,000 acres in Levy County is used for pasture and crops. About 90,100 acres is used for pasture and hay, 3,900 acres is used for vegetable crops, and 14,000 acres is used for other crops. The pasture grasses that are most commonly used for grazing and for hay are Pensacola bahiagrass and coastal bermudagrass. The principal vegetable crop is watermelons. Cucumber, squash, and peppers are also grown. The other principal crops are peanuts, sorghum, corn, tobacco, rye, wheat, oats, and soybeans (fig. 9).

Generally, commercial crops can be grown successfully on a variety of soils in Levy County. Soil drainage is the main management concern. Other management concerns affecting most of the soils used for crops are the generally low natural soil fertility and low pH.

Water erosion is not a serious problem in Levy County. However, it may be a hazard on the unprotected sloping, sandy soils, such as Candler and Orlando soils, and on the gently sloping, loamy or clayey soils, such as Bivans, Micanopy, Pedro, and Levyville soils. Loss of the surface layer generally lowers the productivity of the soil. Fertility and tilth generally deteriorate as the surface layer is lost and parts of the subsurface layer or subsoil become incorporated into the plow layer. Water erosion also reduces the quality of water as sediment, soil nutrients, and pesticides are washed away from cropland into ponds and groundwater supplies.

Erosion-control practices that provide a protective

Figure 9.—Soybeans in an area of Shadeville-Otela complex, 1 to 5 percent slopes.

surface cover, reduce the velocity of surface runoff, and increase the rate of water infiltration can minimize the damage caused by water erosion. These practices include leaving crop residue on the surface, cultivating the sloping and gently sloping soils on the contour, maintaining cover crops between rotations, and growing green manure crops to improve tilth and the water-holding capacity.

Soil blowing is a hazard on unprotected soils that have a dry, loose, sandy surface layer (fig. 10). It does the most damage during late winter and early spring when fields are being cultivated and planted and when the prevailing wind is usually strongest. Soil blowing reduces soil fertility by removing fine soil particles and organic matter; damages crops by sandblasting; spreads diseases, insects, and weed seeds; and creates health hazards and cleaning problems.

Erosion-control practices that provide a protective cover and reduce the velocity of the wind near the surface can minimize the damage caused by soil blowing. These practices include utilizing field windstrips with row crops, aligning rows at right angles to the prevailing wind, establishing windbreaks around fields, and maintaining a cover crop on fields between crop rotations.

Soil fertility is naturally low in most of the soils in the county that are commonly used for crops. Because these soils generally have a loose, sandy surface layer and subsurface layer and are rapidly permeable or very rapidly permeable, added fertilizer and lime may be leached rapidly after heavy rains. Most of these soils are very strongly acid to slightly acid in the surface

layer and are naturally low in nitrogen, potassium, and available phosphorus. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the needs of the crop, and on the expected level of yields.

Soil tilth is an important factor affecting the germination of seeds and the available water capacity. Soils that have good tilth are granular and porous. Because of the loose, sandy surface layer in most of the soils cropped in Levy County, good tilth is difficult to maintain. Utilizing green manure crops in the crop rotation, incorporating crop residue into the soil, and protecting the topsoil from erosion can improve and maintain soil tilth.

Irrigation is necessary during most years if row crops are grown on moderately well drained to excessively drained soils, such as Otela, Tavares, Candler, and Orlando soils. Center-pivot or traveling gun irrigation systems are most commonly used for watermelon, tobacco, and peanut crops. Although these crops can be grown without irrigation, yields are significantly lower during most years than in irrigated areas.

Drainage and *soil bedding* generally are necessary if row crops are grown on poorly drained soils on flatwoods and in sloughs, such as Smyrna, Holopaw, and Placid soils. Shallow surface ditches can help to remove excess surface water if suitable outlets are available. Grassed waterways can be installed on somewhat poorly drained and poorly drained upland soils, such as Bivans and Ft. Green soils, to help remove excess water during the growing season.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification also is shown in the table.

Figure 10.—Soil blowing (in the background) in an area of Shadeville-Otela complex, 1 to 5 percent slopes.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small and yields are hard to estimate. For example, peanut yields average about 3,500 pounds per acre on somewhat poorly drained to excessively drained soils, but some farmers report yields of nearly twice this amount. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for use as cropland. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode, but they have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

There are no subclasses in class I because the soils of this class have few limitations. The soils in class V are subject to little or no erosion, but they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation. Class V contains only the subclasses indicated by *w, s,* or *c.*

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Rangeland

Sid Brantly, range conservationist, Natural Resources Conservation Service, helped prepare this section and the section on grazeable woodland.

Native grasses are an important part of the overall year-round supply of forage to livestock producers in Levy County. The survey area has about 90,000 acres

of rangeland and grazeable woodland *(28)*.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship of the soils, vegetation, and water.

A *range site* is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other range sites in kind, amount, or proportion of range plants. The relationship between soils and vegetation was ascertained during this survey; thus, range sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important.

Total production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the climax plant community. Total production includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants, but it does not include the increase in stem diameter of trees and shrubs.

The vegetation that made up the original natural plant community is called the *climax vegetation*. It generally is the most productive vegetation on that particular site and the most suitable vegetation for livestock. The climax vegetation consists of three kinds of plants that are characterized according to their response to grazing. These are *decreasers, increasers,* and *invaders*. Decreasers generally are the most palatable climax plants. They are eliminated first if the range is subjected to continuous, heavy grazing. Increasers are plants that are less palatable to livestock. They increase temporarily under continuous heavy grazing but eventually also are eliminated. Invaders are plants that are native to the site that have little value as forage. Invaders become established after the other vegetation has been reduced.

Range management requires a knowledge of the kind of soil and the climax vegetation on the range site. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition.

Range site management often includes mechanical brush control, controlled burning, and, most importantly, controlled livestock grazing. Predicting the effects of these practices on range sites is extremely important. Proper management of the native range plant community results in maximum sustained production, conservation of the soil and water resources, and improvement of the habitat for many wildlife species.

Grazeable Woodland

Grazeable woodland is forested land primarily managed for the production of wood. It has an understory of native grasses, legumes, and forbs. The understory is an integral part of the forest plant community. Under proper management the native plants can be grazed without significantly impairing forest values. All of the management factors discussed for rangeland also apply to grazeable woodland, and several additional factors should also be considered. For the purposes of this survey, management considerations are limited to planted pine.

In a forest trees and herbaceous vegetation compete for sunlight and growth. As the trees mature, their height and subsequent canopy closure influence the growth of understory forage. Forest canopy is measured by the percentage of foliar cover of all woody vegetation that is more than 4.5 feet tall. A sharp decline in forage production occurs after the canopy closure reaches a certain point *(18)*. Spacing, planting configuration, and the growth rate of the planted pines are the factors that determine how soon this decline will take place on a particular site. Planting the trees at wider intervals and using alternate planting configurations can extend the period of higher forage production further into the tree rotation, but these practices usually result in a decrease in wood production.

Another factor that should be considered in the management of grazeable woodland is the restricted use of burning in the early years of the rotation. Young slash pine are intolerant of fire until they are 12 to 15 feet tall *(18)*. In areas of wet, loamy, or clayey soils that support native plant communities with a dense hardwood overstory, such as Bivans, Waccasassa, and Wekiva soils, woody invader species begin to reestablish themselves within the first year after the final site preparation and are difficult to control. Thorough site preparation and mechanical brush control are essential in these areas if sustained woodland grazing is planned.

Management for woodland grazing should also include other good management practices, such as maintaining proper stocking rates, fencing that allows rotation grazing, and prescribed burning in established stands. Careful management and planning can increase the quality and duration of woodland grazing, maintain high levels of wood production, and enhance wildlife habitat.

Woodland Management and Productivity

Harrell M. Hemmingway, Levy County forester, Florida Division of Forestry, helped prepare this section.

An understanding of the influence that soils have on forest productivity can increase the ability of woodland owners and managers to make good silvicultural and economic decisions. The relationships between soils and species suitability, growth potential, and forest operations are discussed in this section.

The total land area in Levy County is 703,718 acres. Woodlands make up about 71 percent of the area, or approximately 497,000 acres. Of this total, about 65,000 acres is owned by State, Federal, and local government; 281,000 acres is owned by timber companies; and 151,000 acres is owned by individual or cooperative tree farmers.

The soils on flatwoods are predominantly planted in slash pine, but some areas are planted in loblolly pine. Longleaf pine grows naturally on flatwoods. It was once the dominant species because of its adaptability to the frequent fires. Slash pine, loblolly pine, and longleaf pine grow well on flatwoods.

The soils of the coastal limestone hammocks are predominantly planted in loblolly pine because it is adapted to the soils and has a higher growth rate. Dense stands of hardwoods mixed with loblolly pine, cedar, and cabbage-palm grow naturally in these areas.

The soils of the limestone plains are predominantly planted in slash pine. Dense stands of hardwoods mixed with longleaf pine grow naturally in these areas. Slash pine, loblolly pine, and longleaf pine grow well on the limestone plains. Loblolly pine is the best adapted species for planting on soils that are loamy or clayey near the surface or that have shallow bedrock, such as Mabel or Pedro soils.

The excessively drained and well drained soils on uplands are predominantly planted in slash pine and sand pine. Open stands of turkey oak, live oak, and bluejack oak that are mixed with longleaf pine grow naturally in these areas. Longleaf pine, slash pine, and sand pine can be planted with good results. However, areas of the more droughty Astatula soils and areas of Candler soils that have a continuous loamy layer at a depth of more than about 10 feet are better suited to sand pine.

Traditionally, forestry has had a large influence on the economic development of Levy County. This influence is evident today in the plentiful local forest industry. The total income from forest products in Levy County was more than $20 million in 1986. Products produced by mills in surrounding counties include paper, plywood, crates, furniture, wood chips, and fuel wood. The strong market created by these mills for timber resources has encouraged more intensive management of the woodlands. However, much opportunity for increased production still exists, especially on the many privately owned, nonindustrial properties. These properties support commercial pine species at stocking levels that are much lower than optimal.

Local forestry practices focus on the elimination of cull or weed trees and the reduction of acreage that is understocked in preferred timber species. These practices generally include clearcutting, carefully preparing the site, and replanting monocultures of commercial pine species. The erosion-control measures described in the Florida Division of Forestry's "Silvicultural Best Management Practices Manual" are emphasized in most reforestation activities *(8)*.

Optimal growth rates of commercial pine species are encouraged by reducing competition for light, moisture, and soil nutrients. Prescribed burning reduces competition from undesirable hardwood species, reduces dangerous fuel levels, and improves accessibility, esthetics, and wildlife habitat. Thinning activities help to reduce excessive competition between the pines and provide an opportunity to remove diseased or poorly formed trees. Thinning and prescribed burning also increase the amount of light reaching the grasses and herbaceous understory used for improved woodland grazing.

Several factors influence the relative ability of soils to produce pine trees. These include the capacity of the soil to store moisture and nutrients, the depth to the water table, and the amount of root development permitted by the physical properties of the soil. A consideration of these soil factors can provide a fundamental basis for many timber management decisions. These factors are further discussed in each of the detailed soil map unit descriptions. Additional information on soils and timber management is available through the local offices of the Natural Resources Conservation Service, the Florida Division of Forestry, and the Florida Cooperative Extension Service.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the survey area suitable for timber includes information about productivity, limitations in harvesting timber, and management concerns in producing timber. The common forest understory plants also are listed. Table 7 summarizes

this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Table 7 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation affecting use and management. The letter *R* indicates a soil that has a significant limitation because of steepness of slope. The letter *X* indicates that a soil has restrictions because of stones or rocks on the surface. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *T* indicates a soil that has, within the root zone, excessive alkalinity or acidity, sodium salts, or other toxic substances that limit the development of desirable trees. The letter *D* indicates a soil that has a limitation because of a restricted rooting depth, such as a shallow soil that is underlain by hard bedrock, a hardpan, or other layers that restrict roots. The letter *C* indicates a soil that has a limitation because of the kind or amount of clay in the upper part of the profile. The letter *S* indicates a dry, sandy soil. The letter *F* indicates a soil that has a large amount of coarse fragments. The letter *A* indicates a soil having no significant limitations that affect forest use and management. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation or harvesting activities expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion-control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of moderate or severe indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning harvesting and reforestation activities, or the use of special equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, and susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. On the steeper slopes, tracked equipment is needed. On the steepest slopes, even tracked equipment cannot be operated and more sophisticated systems are needed. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are so steep that wheeled equipment cannot be operated safely across the slope, if wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if slopes are so steep that tracked equipment cannot be operated safely across the slope, if wetness restricts equipment use for more than 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

Ratings of *seedling mortality* refer to the probability of the death of naturally occurring or properly planted seedlings of good stock in periods of normal rainfall, as influenced by kinds of soil or topographic features. Seedling mortality is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, rooting depth, and the aspect of the slope. The mortality rate generally is highest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of moderate or severe indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing a surface drainage system, and providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is moderate or severe.

Ratings of *windthrow hazard* indicate the likelihood that trees will be uprooted by the wind. A restricted rooting depth is the main reason for windthrow. The rooting depth can be restricted by a high water table, a fragipan, or bedrock or by a combination of such factors as wetness, texture, structure, and depth. The risk is *slight* if strong winds cause trees to break but do not uproot them; *moderate* if strong winds cause an occasional tree to be blown over and many trees to break; and *severe* if moderate or strong winds commonly blow trees over. Ratings of moderate or severe indicate that care is needed in thinning or that

the stand should not be thinned at all. Special equipment may be needed to prevent damage to shallow root systems in partial cutting operations. A plan for the periodic removal of windthrown trees and the maintenance of a road and trail system may be needed.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. Plant competition is more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants hinders adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants hinders natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A moderate or severe rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

The *potential productivity* of *common trees* on a soil is expressed as a *site index*. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate. The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands. The estimates of the productivity of the soils in this survey are based on published data *(15, 21, 23)*.

The *productivity class* represents an expected volume produced by the most important trees, expressed in cubic meters per hectare per year calculated at the age of culmination of mean annual increment.

Trees to plant are those that are used for reforestation or, under suitable conditions, natural regeneration. They are suited to the soils and can produce a commercial wood crop. The desired product, topographic position (such as a low, wet area), and personal preference are three factors among many that can influence the choice of trees for use in reforestation.

Windbreaks and Environmental Plantings

Windbreaks protect crops, livestock, buildings, and yards from wind and blowing sand. They also protect fruit trees and gardens and furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs planted around field borders and intermittent rows of small grain planted among crops provide the most protection.

Field windbreaks and field windstrips are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. Windbreaks generally consist of two to four rows of slash pine, loblolly pine, or eastern redcedar planted around field borders. Field windstrips generally consist of intermittent rows of rye or sorghum that are planted among row crops, such as watermelons or tobacco. The interval depends on the erodibility of the soil and the crop being grown. Combinations of field windbreaks and windstrips help to protect young crops from the sandblasting effects of blowing topsoil, minimize topsoil loss because of soil blowing, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition. Irrigation and mulching may be needed on some of the more droughty soils, such as Apopka and Candler soils.

Additional information on planning windbreaks, windstrips, and screens and on planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service or from a nursery.

Recreation

Recreational facilities, such as parks, playgrounds, and golf courses, are somewhat limited in Levy County. However, areas of woodland and water provide ample opportunity for recreational activities.

Hunting is a very popular activity for local enthusiasts and also for people who travel great distances to hunt in the area. Extensive and well managed game preserves are maintained throughout the western part of the county. The pine plantations and upland fields throughout the rest of the county also provide good hunting opportunities. Because camping often accompanies hunting, numerous hunting camps and privately operated campgrounds are maintained throughout the county. Fishing, for both freshwater and

saltwater species, is very popular. The numerous creeks, ponds, and shallow lakes in addition to three unspoiled rivers and the Gulf of Mexico provide diversity for anglers. Boating is also a common activity. Marinas are operated near the mouths of the Withlacoochee, Waccasassa, and Suwannee Rivers. The cool freshwater springs that are common throughout the county are irresistible swimming holes during the summer and are popular picnic areas throughout the year. Manatee Springs near Chiefland and the Blue Grotto near Williston offer underwater caverns that can be explored by scuba divers. Many of the small islands in the Cedar Key area have secluded beaches.

In table 8, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes, stones, or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Wildlife is an important and protected natural resource in Levy County. The importance of wildlife to the human inhabitants of the county dates back more than 400 years, when the Timucuan Indians thrived on the abundance of game and fish in the area. Since then wildlife habitat has diminished significantly. About 163,000 acres are currently used for pasture, crops, and residential development. However, game populations in most of the remaining woodlands and wetlands have remained abundant. In 1989 revenues of nearly $72,000 were generated in Levy County from the sale of hunting and fishing licenses. Many thousands of acres of private land are leased to hunting clubs. These leases provide an additional annual income of $2 to $3 per acre for the land owners.

The most extensive areas of good wildlife habitat are in the Gulf Hammock area of the county. The pine plantations on flatwoods, the hardwood forests and wetlands on the flood plains of the Suwannee and

Figure 11.—Sandhill cranes in an area of Placid and Popash soils, depressional.

Waccasassa Rivers, and the wooded uplands along the western edge of the Chiefland Limestone Plain also provide good habitat for many game species. The most desirable game species in these areas are white-tailed deer, wild turkey, and feral hogs. Mourning dove and bobwhite quail are numerous in the upland areas of the county. Many other game and nongame species, including bobcats, alligators, foxes, raccoons, gray squirrels, fox squirrels, otters, armadillos, owls, woodpeckers, and a variety of other birds, reptiles, and small mammals, also inhabit these areas.

The tidal marshes and associated estuarine areas provide habitat for gulls, brown pelicans, osprey, and bald eagles. They also serve as nursery and feeding areas for many commercially important marine species, including oysters, blue crabs, mullet, and a variety of game fish.

Although land development and human population continue to increase in Levy County, the importance of preserving and improving wildlife habitat and game populations is recognized. More than 68,000 acres of good wildlife habitat has been designated as State or Federal wildlife preserves. The timberland that is leased to hunting clubs is managed to improve the wildlife habitat and game populations on the property. Privately managed areas are also managed to improve the wildlife habitat.

Endangered or threatened species that inhabit the county include bald eagles, American alligators, red-cockaded woodpeckers, wood storks, West Indian manatees, and sandhill cranes (fig. 11). A complete list of endangered and threatened species and information on their range and habitat needs can be obtained from the local office of the Natural Resources Conservation Service.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain

and seed crops are corn, browntopmillet, rye, and grain sorghum.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are bahiagrass, pangolagrass, clover, and hairy indigo.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, and partridge pea.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, maple, sweetgum, persimmon, dogwood, hickory, gallberry, saw palmetto, and blackberry.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, cypress, and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, pickerelweed, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, creeks, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, dove, meadowlark, sandhill crane, cottontail, red fox, and gopher tortoise.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, feral hogs, owls, bobcats, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, otters, herons, shore birds, alligators, and turtles.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates

were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm, dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. Depth to a high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, depth to a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or

maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, depth to a water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability,

more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, and few cobbles and stones. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, or many stones. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as limestone or dolomite, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles and have little or no gravel. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material or soils that have an appreciable amount of gravel, stones, or soluble salts. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content.

Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant nutrients as it decomposes.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 20.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 20.

Rock fragments 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-

weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index generally are rounded to the nearest 5 percent. Thus, if ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence the shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water through the soil when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage in each major soil layer is stated in inches of water per inch of soil. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of

undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, more than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are extremely erodible. Crops can be grown if intensive measures to control soil blowing are used.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.

5. Noncalcareous loams and silt loams that are less than 18 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.

6. Noncalcareous loams and silt loams that are more than 18 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.

8. Soils that are not subject to soil blowing because of rock fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when

thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in table 16, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 16 gives the frequency and duration of flooding. Frequency and duration are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent*. *None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month).

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table and the kind of water table, that is, *perched* or *apparent*. A water table that is seasonally high for less than 1 month is not indicated in table 16.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Physical, Chemical, and Mineralogical Analyses of Selected Soils

Dr. Mary E. Collins, associate professor, University of Florida, Soil Science Department, prepared this section.

Parameters for physical, chemical, and mineralogical properties of representative pedons sampled in Levy County are presented in tables 17, 18, and 19. The analyses were conducted and coordinated by the Soil Genesis and Characterization Research Laboratory at the University of Florida. Detailed descriptions of the analyzed soils are given in the section "Soil Series and Their Morphology." Laboratory data and profile information for additional soils in Levy County, as well as for other counties in Florida, are part of a computerized soil information data base at the University of Florida, Soil Science Department.

Typical pedons were sampled from pits at carefully selected locations. Samples were air dried, crushed, and sieved through a 2-millimeter screen. Most analytical methods used are outlined in a soil survey investigations report *(22)*.

Particle-size distribution was determined using a modified pipette method with sodium hexametaphosphate dispersion. Hydraulic conductivity and bulk density were determined on undisturbed soil cores. Water retention parameters were obtained from duplicate undisturbed soil cores placed in tempe pressure cells. Weight percentages of water retained at 100-centimeters water (1/10-bar) and 345-centimeters water (1/3-bar) were calculated from volumetric water percentages divided by bulk density. Samples were ovendried and ground to pass a 2-millimeter sieve, and the 15-bar water retention was determined. Organic carbon was determined by a modification of the Walkey-Black wet combustion method.

Extractable bases were obtained by leaching soils with normal ammonium acetate buffered at pH 7.0. Sodium and potassium in the extract were determined by flame emission. Calcium and magnesium were determined by atomic absorption spectrophotometry. Extractable acidity was determined by the barium chloride-triethanolamine method at pH 8.2. Cation-exchange capacity was calculated by adding the values of extractable bases and extractable acidity. Base saturation is the ratio of extractable bases to cation-exchange capacity expressed in percent. The pH measurements were made with a glass electrode using a soil-water ratio of 1:1; a 0.01 molar calcium chloride solution in a 1:2 soil-solution ratio; and normal potassium chloride solution in a 1:1 soil-solution ratio.

Electrical conductivity determinations were made with a conductivity bridge on 1:1 soil to water mixtures. Iron and aluminum extractable in sodium dithionite-citrate were determined by atomic absorption spectrophotometry. Aluminum, carbon, and iron were extracted from probable spodic horizons with 0.1 molar sodium pyrophosphate. Determination of aluminum and iron was by atomic absorption, and determination of extracted carbon was by the Walkey-Black wet combustion method.

Mineralogy of the clay fraction less than 2 microns was ascertained by x-ray diffraction. Peak heights at 18-angstrom, 14-angstrom, 10-angstrom, 7.2-angstrom, 4.83-angstrom, and 3.34-angstrom positions represent montmorillonite, interstratified expandable vermiculite or 14-angstrom intergrades, mica, kaolinite, gibbsite, and quartz, respectively. Peaks were measured, added, and normalized to give the percent of soil minerals identified in the x-ray diffractograms. These percentage values do not indicate absolute determined quantities of soil minerals but do imply a relative distribution of minerals in a particular mineral suite. Absolute percentages would require additional knowledge of particle size, crystallinity, unit structure substitution, and matrix problems.

Physical Properties

The results of physical analyses are shown in table 17. Soils sampled in Levy County for laboratory analyses are inherently very sandy; however, some of the pedons have an argillic horizon in the lower part of the solum. All of the soils have one or more horizons in which the total sand content is more than 90 percent. Adamsville, Astatula, Candler, Orsino, Smyrna, and Tavares soils have more than 94 percent sand to a depth of 80 inches or more. Lutterloh, Millhopper, Otela, and Sparr soils have more than 90 percent sand to a depth of approximately 40 inches.

The content of clay in these excessively sandy horizons is rarely more than 4 percent. Deep argillic horizons in the Ft. Green, Hicoria, Jonesville, Lutterloh, Millhopper, Moriah, Otela, Pedro, Sparr, Wauchula, and Wekiva soils have enhanced amounts of clay ranging from 13.6 to 75.5 percent.

The content of silt is more than 20 percent in one horizon of the Cracker soil. It is more than 10 percent in one or more horizons of the Cracker, Demory, Matmon, and Moriah soils but, more commonly, is less than 5 percent in all other soils.

Fine sand dominates the sand fractions in most of the soils sampled. However, one or more horizons of the Ft. Green, Hicoria, Mabel, and Moriah soils are more than 20 percent medium sand. All horizons of the Astatula, Candler, Orsino, and Tavares soils have more than 75 percent fine sand. The content of very coarse

sand is less than 0.2 percent in the Ft. Green, Hicoria, Mabel, and Otela soils. Very coarse sand is totally absent in the Adamsville, Astatula, Candler, Cracker, Demory, Lutterloh, Matmon, Millhopper, Moriah, Orsino, Pedro, Smyrna, Sparr, Tavares, and Wauchula soils. The content of coarse sand is less than 1 percent in the Adamsville, Astatula, Candler, Matmon, Millhopper, Orsino, Smyrna, Sparr, Tavares, Wauchula, and Wekiva soils. The content of very fine sand ranges from 2.0 percent in three horizons of the Wauchula soil to 40.6 percent in the E horizon. The sandy soils in Levy County rapidly become droughty during periods of low precipitation when rainfall is widely scattered. Conversely, they are rapidly saturated during periods of heavy rainfall.

Hydraulic conductivity values range from 0 to more than 65 centimeters per hour. The highest values generally are representative of the moderately well drained to excessively drained sands, and the lowest values are representative of the deeper argillic horizons. The higher clay content in the Hicoria, Levyville, Mabel, and Matmon soils results in low hydraulic conductivity values at depths that could affect the design and function of septic tank absorption fields. Hydraulic conductivity values of less than 10 centimeters per hour are recorded for some sandy surface horizons, for argillic horizons, and for some horizons of the Smyrna and Wauchula soils.

The amount of water available to plants can be estimated from bulk density and water content data. In excessively sandy soils, such as Adamsville, Astatula, Candler, Orsino, and Tavares soils, the amount of water available to plants is very low. Conversely, soils that have a higher amount of fine textured material or a higher content of organic material retain larger amounts of available water.

Chemical Properties

The results of chemical analyses are shown in table 18. The soils in Levy County have a wide range of extractable bases. Except for the Cracker, Demory, Levyville, Mabel, Matmon, Pedro, Waccasassa, and Wekiva soils, all of the soils that were sampled have one or more horizons with less than 1 milliequivalent per 100 grams extractable bases. Cracker soils have a surface soil with more than 65 milliequivalents per 100 grams extractable bases. Cracker, Demory, Ft. Green, Jonesville, Levyville, Mabel, Matmon, Moriah, Waccasassa, and Wekiva soils have one or more horizons with more than 10 milliequivalents per 100 grams extractable bases. These high amounts are associated with a high content of clay. The mild, humid climate of Levy County results in the depletion of basic cations (calcium, magnesium, sodium, and potassium) through leaching.

Calcium is the dominant base in most of the soils that were sampled; however, levels of magnesium are higher than those of calcium in the deeper horizons of the Millhopper, Orsino, and Wauchula soils. Some horizons of the Candler, Cracker, Demory, Ft. Green, Hicoria, Jonesville, Levyville, Lutterloh, Mabel, Matmon, Moriah, Otela, Pedro, Shadeville, Sparr, Waccasassa, and Wekiva soils contain more than 1 milliequivalent per 100 grams extractable calcium. The content of extractable magnesium is more than 1 milliequivalent per 100 grams in some horizons of the Cracker, Demory, Ft. Green, Levyville, Mabel, Matmon, Moriah, Sparr, and Wekiva soils. Detectable amounts of magnesium are in all horizons of all other pedons. The amount of sodium generally is less than 0.1 milliequivalent per 100 grams; however, one or more horizons of the Cracker, Demory, Ft. Green, Lutterloh, Mabel, Smyrna, Sparr, and Waccasassa soils exceed this amount. Except for some horizons of the Tavares soil, all of the soils that were sampled contain detectable amounts of sodium. Most of the soils in Levy County contain less than 0.1 milliequivalent per 100 grams potassium. Cracker, Demory, Ft. Green, Hicoria, Levyville, Mabel, Matmon, Moriah, Sparr, Tavares, and Waccasassa soils have a few horizons that exceed this amount. Except for the Millhopper soil, all of the soils that were sampled have detectable amounts of potassium.

Values for cation-exchange capacity, an indication of plant-nutrient capacity and ability to retain positively charged ions on colloidal surfaces, exceeded 10 milliequivalents per 100 grams in the surface layer of Cracker, Demory, Waccasassa, and Wekiva soils. Cation-exchange capacity exceeded 10 milliequivalents per 100 grams in the argillic horizons of Ft. Green, Jonesville, Levyville, Mabel, Matmon, Waccasassa, and Wekiva soils. Soils, such as Astatula and Orsino soils, that have low cation-exchange capacities in the surface layer require only small amounts of lime to significantly alter the base status and soil reaction. Generally, soils that have low inherent soil fertility are associated with low values for extractable bases and low cation-exchange capacities and fertile soils are associated with high values for extractable bases, high base saturation values, and high cation-exchange capacities.

The content of organic carbon is less than 1 percent in the Astatula, Candler, Ft. Green, Jonesville, Levyville, Lutterloh, Moriah, Orsino, Otela, Pedro, Shadeville, and Tavares soils. Cracker, Demory, Hicoria, Matmon, Sparr, Waccasassa, and Wekiva soils have more than 1.5 percent organic carbon in the surface layer. Cracker

and Demory soils have more than 12 percent organic carbon in the surface layer. Adamsville, Mabel, Millhopper, Smyrna, and Wauchula soils have between 1.0 and 1.5 percent organic carbon in the surface layer. Organic carbon in the spodic horizon of the Smyrna and Wauchula soils has been translocated. In the other soils, the content of organic carbon decreases rapidly with increasing depth. Since the content of organic carbon in the surface layer is directly related to the nutrient- and water-holding capacities of sandy soils, management practices that conserve organic carbon are highly desirable.

Electrical conductivity values are very low for all of the soils sampled in Levy County, ranging from nondetectable in many horizons to 0.24 millimho per centimeter in the surface layer of the Waccasassa soil. These data indicate that the content of soluble salts in the soils sampled in Levy County are insufficient to hinder the growth of salt-sensitive plants.

Soil reaction in water generally ranges from pH 4.0 to pH 6.0. The reaction is approximately 0.5 to 1.0 pH unit lower in potassium chloride and calcium chloride solutions than it is in water. A few pH values are greater than 7. The maximum availability of plant nutrients is generally attained when reaction is between pH 6.5 and 7.5. In Florida, however, maintaining reaction above pH 6.5 is not economically feasible for most kinds of agricultural production.

The ratio of sodium pyrophosphate extractable carbon and aluminum to clay in the Bh horizon of the Smyrna soil is sufficient to meet the chemical criteria established for spodic horizons. Field morphology was used to determine the spodic horizon in the Wauchula soil. Sodium pyrophosphate extractable iron is less than 0.04 percent in the spodic horizon of the Smyrna and Wauchula soils.

The content of citrate-dithionite extractable iron ranges from 3.32 percent in the argillic horizon of the Wekiva soil to 0.02 percent in the BC horizon of the Smyrna soil. The content of aluminum extracted by citrate-dithionite from the Bt horizon ranges from 0 percent in the Candler soil to 0.54 percent in the Waccasassa soil. The content of extractable iron and aluminum in the soils in Levy County is not sufficient to restrict the availability of phosphorus.

Mineralogical Properties

Sand fractions, 0.05 millimeter to 2.0 millimeters in size, are siliceous. Quartz is overwhelmingly dominant in all pedons. Varying amounts of heavy minerals are in most horizons. The greatest concentration is in the very fine sand fraction. The crystalline mineral components of the clay fraction, which is less than 0.002 millimeter in size, are reported in table 19 for the major horizons of the pedons sampled. The clay mineralogical suite was made up of montmorillonite, a 14-angstrom intergrade, kaolinite, gibbsite, and quartz.

Montmorillonite was not detected in the Astatula, Candler, Jonesville, Lutterloh, Millhopper, Moriah, Orsino, Otela, Pedro, Smyrna, Sparr, Tavares, and Waccasassa soils. The 14-angstrom intergrade occurs in all of the pedons sampled. Kaolinite occurs in all other horizons for which determinations for clay identification were made, except for the Matmon soil. Gibbsite occurs in the Astatula and Candler soils, the surface layer of the Cracker soil, and the C4 horizon of the Tavares soil. All of the pedons sampled contain varying amounts of quartz.

Montmorillonite, which occurs in some of the soils in Levy County, is probably the least stable mineral component in the present acidic environment. A large percentage (more than 50 percent) of montmorillonite occurs in the argillic horizons of Ft. Green, Hicoria, Matmon, and Wauchula soils. Considerable volume change could result from shrinking and swelling of montmorillonitic soil materials that have a high content of clay. The occurrence of relatively large amounts of 14-angstrom intergrades and the general, although inconsistent, tendency of these minerals to decrease as pedon depth increases suggest that the 14-angstrom intergrade minerals are among the most stable species in this weathering environment. Kaolinite occurs erratically throughout all of the deep, sandy pedons, indicating that these soils were formed from severely weathered parent material. Clay-sized quartz has primarily resulted from weathering of the silt fraction. Soils that are dominated by montmorillonite and 14-angstrom intergrades have a much higher cation-exchange capacity and retain more plant nutrients than soils dominated by kaolinite and quartz. The total content of clay influences the use and management of the soils in Levy County more frequently than the clay mineralogy.

Engineering Index Test Data

Table 20 shows laboratory test data for several pedons sampled at carefully selected sites in the county. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were tested by the Florida Department of Transportation Soils Laboratory, Bureau of Materials and Research.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

Table 20 contains engineering test data about some of the major soils in Levy County. These tests help to evaluate the soils for engineering purposes. The classifications given are based on data obtained by mechanical analysis and by tests to determine liquid limits and plastic limits.

The mechanical analyses were made by the combined sieve and hydrometer method *(3)*. When this method is applied, the various grain-size fractions are calculated on the basis of all the material in the soil sample, including that coarser than 2 millimeters in diameter. The results of this method should not be used in naming textural classes of soils.

Liquid limit and plasiticity index indicate the effect of water on the strength and consistence of the soil material. As the moisture content of a dry, clayey soil is increased, the material changes from a dry state to a semisolid state and then to a plastic state. If the moisture content is further increased, the material changes from plastic to liquid. The plastic limit is the moisture content at which the soil material changes from a semisolid state to a plastic state, and the liquid limit is the moisture content at which the soil material changes from a plastic state to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which soil material is plastic. The data on liquid limit and plasticity index in table 20 are based on laboratory tests of soil samples.

Compaction, or moisture-density, data are important in earthwork. If soil material is compacted at a successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, density decreases with an increase in moisture content. The highest dry density obtained in the compactive test is termed maximum dry density. As a rule, maximum strength of earthwork is obtained if the soil is compacted to the maximum dry density.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(20)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders, primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Psammaquents (*Psamm*, meaning sandy texture, plus *aquent*, the suborder of the Entisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Psammaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is siliceous, hyperthermic Typic Psammaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the substratum within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(25)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(20)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Adamsville Series

The Adamsville series consists of very deep, somewhat poorly drained soils that formed in sandy marine sediments. These soils are on low ridges and

knolls that are on or adjacent to flatwoods. Slope ranges from 0 to 5 percent. The soils are hyperthermic, uncoated Aquic Quartzipsamments.

Adamsville soils are geographically associated with Immokalee, Lutterloh, Orsino, Pomello, Pompano, Smyrna, Sparr, Tavares, and Zolfo soils. Immokalee, Smyrna, and Pompano soils are poorly drained and are in the lower landscape positions. Immokalee, Pomello, Smyrna, and Zolfo soils have a spodic horizon. Lutterloh and Sparr soils have an argillic horizon. Orsino and Tavares soils are moderately well drained and are in the higher landscape positions.

Typical pedon of Adamsville fine sand, 0 to 5 percent slopes, approximately 800 feet west and 1,000 feet south of the northeast corner of sec. 19, T. 12 S., R. 17 E.

Ap1—0 to 6 inches; fine sand, very dark gray (10YR 3/1) rubbed; weak fine granular structure; very friable; many fine and very fine and few coarse roots; very strongly acid; clear wavy boundary.

Ap2—6 to 14 inches; dark gray (10YR 4/1) fine sand; few fine and medium distinct pale brown (10YR 6/3) streaks and pockets; weak fine granular structure; very friable; many fine and very fine and few coarse roots; very strongly acid; gradual wavy boundary.

C1—14 to 32 inches; grayish brown (10YR 5/2) fine sand; few fine distinct yellowish brown (10YR 5/4) and very dark gray (10YR 3/1) mottles and streaks; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

C2—32 to 43 inches; pale brown (10YR 6/3) fine sand; many fine prominent brownish yellow (10YR 6/8) mottles; single grained; loose; few fine roots; very strongly acid; clear wavy boundary.

C3—43 to 70 inches; light gray (10YR 7/2) fine sand; common fine distinct very pale brown (10YR 7/4) and few fine and medium prominent yellowish red (5YR 5/8) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

C4—70 to 80 inches; white (10YR 8/2) fine sand; common medium prominent brownish yellow (10YR 6/8) mottles; single grained; loose; strongly acid.

The thickness of the sandy sediments is more than 80 inches. Reaction ranges from very strongly acid to neutral throughout the profile.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It generally ranges from 3 to 14 inches in thickness. If value is 3, the horizon is less than 10 inches thick.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 4. It has mottles in shades of gray, brown, or yellow. It is sand or fine sand.

Albany Series

The Albany series consists of very deep, somewhat poorly drained, occasionally flooded soils that formed in sandy and loamy marine sediments. These soils are on slightly elevated knolls and ridges on the flood plain of the Suwannee River. Slope ranges from 0 to 2 percent. The soils are loamy, siliceous, thermic Grossarenic Paleudults.

Albany soils are geographically associated with Bradenton, Chobee, Gator, Holopaw, Myakka, Orsino, Ousley, Pineda, Pompano, and Terra Ceia soils. Chobee soils have a loamy mollic epipedon, are very poorly drained, and are in the lower landscape positions. Bradenton, Holopaw, Myakka, Pineda, and Pompano soils are in the lower landscape positions and are poorly drained. Bradenton soils have a loamy argillic horizon within a depth of 20 inches, and Pineda soils have a loamy argillic horizon at a depth of 20 to 40 inches. Myakka, Ousley, and Pompano soils are sandy to a depth of more than 80 inches. Myakka soils have a spodic horizon. Gator and Terra Ceia soils have a histic epipedon, are very poorly drained, and are in the lower landscape positions. Orsino soils are sandy to a depth of more than 80 inches, are moderately well drained, and are in the higher landscape positions.

Typical pedon of Albany fine sand, in an area of Ousley-Albany complex, occasionally flooded; approximately 1,200 feet west of the southeast corner of sec. 23, T. 11 S., R. 13 E.

A—0 to 6 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; very strongly acid; abrupt smooth boundary.

AE—6 to 15 inches; brown (10YR 4/3) fine sand; single grained; loose; very strongly acid; gradual smooth boundary.

E—15 to 50 inches; light yellowish brown (2.5Y 6/4) fine sand; single grained; loose; very strongly acid; clear smooth boundary.

Bt—50 to 65 inches; yellowish brown (10YR 5/4) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) and common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual smooth boundary.

Btg—65 to 80 inches; light gray (10YR 7/1) sandy clay loam; many coarse prominent dark yellowish brown (10YR 4/6) and red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; very strongly acid.

The solum is more than 80 inches thick. Reaction ranges from very strongly acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. It ranges from 4 to 6 inches in thickness. Some pedons have an AE horizon underlying the A horizon. The AE horizon has hue of 10YR, value of 4, and chroma of 3. It is less than 12 inches thick.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 4. In some pedons it has mottles in shades of yellow, brown, or gray and sand strippings in shades of gray. It is sand or fine sand. The combined thickness of the A and E horizons ranges from 40 to 78 inches.

Some pedons have a Bt horizon that overlies the Btg horizon. The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It has mottles in shades of red, yellow, brown, or gray. It is sandy loam, fine sandy loam, or sandy clay loam. It is less than 20 inches thick.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of gray, brown, yellow, or red. It is sandy loam, fine sandy loam, or sandy clay loam.

Apopka Series

The Apopka series consists of very deep, well drained soils that formed in sandy and loamy marine sediments. These soils are on uplands. Slope ranges from 1 to 5 percent. The soils are loamy, siliceous, hyperthermic Grossarenic Paleudults.

Apopka soils are geographically associated with Astatula, Candler, Millhopper, Orlando, and Tavares soils. Astatula, Candler, Orlando, and Tavares soils do not have an argillic horizon within a depth of 80 inches. Millhopper and Tavares soils are moderately well drained.

Typical pedon of Apopka fine sand, in an area of Candler-Apopka complex, 1 to 5 percent slopes; approximately 100 feet south and 3,000 feet east of the northwest corner of sec. 27, T. 13 S., R. 17 E.

Ap—0 to 4 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; neutral; clear wavy boundary.

E1—4 to 10 inches; yellowish brown (10YR 5/6) fine sand; single grained; loose; neutral; clear wavy boundary.

E2—10 to 45 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; slightly acid; clear smooth boundary.

E3—45 to 60 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; strongly acid; clear wavy boundary.

EB—60 to 71 inches; reddish yellow (7.5YR 6/6) loamy fine sand; weak fine subangular blocky structure; very friable; very strongly acid; clear wavy boundary.

Bt—71 to 80 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; very strongly acid.

The solum is more than 80 inches thick. Reaction ranges from very strongly acid to neutral in the A and E horizons and from very strongly acid to moderately acid in the EB and Bt horizons.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2. It ranges from 4 to 8 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 6. In some pedons it has white or light gray sand strippings.

Some pedons have an EB horizon, which has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 6 to 8. The EB horizon is less than 12 inches thick. The combined thickness of the A, E, and EB horizons ranges from 40 to 78 inches.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 6 to 8. In some pedons it has mottles in shades of red, yellow, or brown. It has common gray or white sand strippings between peds. The Bt horizon is fine sandy loam or sandy clay loam. It is more than 4 inches thick.

Aripeka Series

The Aripeka series consists of moderately deep, somewhat poorly drained soils that formed in sandy and loamy marine sediments underlain by limestone. These soils are on low ridges. Slope ranges from 0 to 2 percent. The soils are fine-loamy, siliceous, hyperthermic Aquic Hapludalfs.

Aripeka soils are geographically associated with Boca, Chobee, Matmon, Pineda, Waccasassa, and Wekiva soils. Chobee soils are in the lower landscape positions, are very poorly drained, and do not have limestone within a depth of 40 inches. Boca and Pineda soils are poorly drained and have a sandy epipedon that is more than 20 inches thick. Pineda soils do not have limestone within a depth of 40 inches. Matmon, Waccasassa, and Wekiva soils have limestone within a depth of 20 inches. Waccasassa and Wekiva soils are poorly drained.

Typical pedon of Aripeka fine sand, in an area of Aripeka-Matmon complex; approximately 100 feet east and 100 feet north of the southwest corner of sec. 28, T. 14 S., R. 16 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; common fine and very fine roots; neutral; abrupt smooth boundary.

Bw—6 to 12 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose; common fine and very fine roots; neutral; clear smooth boundary.

Bt—12 to 24 inches; strong brown (7.5YR 4/6) fine sandy loam; weak fine subangular blocky structure; very friable; slightly sticky and nonplastic; common fine and medium roots; neutral; abrupt irregular boundary.

2R—24 inches; limestone bedrock that can be dug with light power machinery.

The solum ranges from 20 to 25 inches in thickness. The depth to limestone bedrock ranges from 23 to 40 inches, but in solution holes it ranges to 45 inches or more. Reaction ranges from very strongly acid to neutral in the A, E, and Bw horizons and from slightly acid to mildly alkaline in the Bt horizon. In many pedons the content of limestone gravel and cobbles on the surface or buried within the solum is as much as 5 percent.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It ranges from 3 to 7 inches in thickness.

Some pedons have a thin E horizon above the Bw horizon. This horizon has hue of 10YR, value of 5, and chroma of 2 or value of 6 and chroma of 2 or 3. It is less than 10 inches thick.

The Bw horizon has hue of 10YR, value of 5, and chroma of 3 to 6. In some pedons it has mottles in shades of brown or yellow. It is less than 16 inches thick.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. In some pedons it has mottles in shades of brown or yellow. The Bt horizon is fine sandy loam or sandy clay loam. It ranges from 5 to 33 inches in thickness.

In some pedons a 2Cr horizon is below a depth of 20 inches. This horizon is soft limestone that can be dug with difficulty with a shovel. Random cobble- or stone-sized limestone fragments are throughout the horizon. The 2Cr horizon is less than 10 inches thick.

The 2R horizon is limestone bedrock that can be excavated only with power equipment. In many pedons the bedrock has solution holes filled with soil material similar to that of the Bt or 2Cr horizon or crevices filled with water.

Astatula Series

The Astatula series consists of very deep, excessively drained soils that formed in sandy marine sediments. These soils are on uplands. Slope ranges from 1 to 8 percent. The soils are hyperthermic, uncoated Typic Quartzipsamments.

Astatula soils are geographically associated with Apopka, Candler, Millhopper, Orlando, and Tavares soils. Apopka and Millhopper soils have an argillic horizon. Apopka soils are well drained, and Millhopper soils are moderately well drained. Candler soils have lamellae within a depth of 80 inches. Orlando soils are 5 to 10 percent silt and clay between depths of 10 and 40 inches. They have an umbric epipedon. Tavares soils are moderately well drained.

Typical pedon of Astatula fine sand, 1 to 8 percent slopes, approximately 600 feet south and 1,000 feet west of the northeast corner of sec. 23, T. 12 S., R. 17 E.

A—0 to 5 inches; fine sand, dark gray (10YR 4/1) rubbed; unrubbed, the mixture of coated and uncoated sand grains has a salt-and-pepper appearance; fine sand; single grained; loose; common fine and very fine and common medium roots; strongly acid; clear wavy boundary.

C1—5 to 25 inches; yellow (10YR 7/6) fine sand; common medium and coarse distinct brown (10YR 4/3 and 5/3) pockets and krotovinas; single grained; loose; few fine and very fine and few medium roots; strongly acid; diffuse wavy boundary.

C2—25 to 59 inches; yellow (10YR 7/6) fine sand; few fine distinct very pale brown (10YR 8/3) pockets and streaks; single grained; loose; few fine and very fine roots; strongly acid; diffuse wavy boundary.

C3—59 to 80 inches; yellow (10YR 7/6) fine sand; many fine and medium distinct very pale brown (10YR 8/3) pockets and streaks; single grained; loose; few fine and very fine roots; very strongly acid.

The soils are more than 80 inches thick. Reaction ranges from very strongly acid to slightly acid throughout, except in areas that have been limed. The content of silt and clay is less than 5 percent throughout the profile.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 3 to 7 inches in thickness.

Some pedons have a thin AC horizon below the A horizon. This horizon has hue of 10YR, value of 6, and chroma of 3. It is less than 4 inches thick. It is sand or fine sand.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 6. In some pedons it has white or light gray pockets or streaks of uncoated sand grains. Matrix values of 8 are generally only in the lower parts of the C horizon. The texture is sand or fine sand.

Bivans Series

The Bivans series consists of very deep, somewhat poorly drained soils that formed in sandy and clayey marine sediments. These soils are on uplands. Slope ranges from 2 to 5 percent. The soils are fine,

montmorillonitic, hyperthermic Typic Albaqualfs.

Bivans soils are geographically associated with Adamsville, Ft. Green, Hicoria, Holopaw, Lochloosa, Mabel, Micanopy, Popash, Sparr, and Tavares soils. Adamsville and Tavares soils are sandy to a depth of more than 80 inches and are better drained than the Bivans soils. Ft. Green soils have a sandy epipedon that is 20 to 40 inches thick. Hicoria and Popash soils are very poorly drained, are in the lower landscape positions and have an umbric epipedon. Holopaw soils are in the lower landscape positions, and have a sandy epipedon that is more than 40 inches thick. Mabel soils have bedrock between depths of 40 and 72 inches. Micanopy soils do not have a seasonal high water table within a depth of 18 inches. Lochloosa and Sparr soils have a sandy epipedon that is more than 20 inches thick.

Typical pedon of Bivans fine sand, in an area of Ft. Green-Bivans complex, 2 to 5 percent slopes; approximately 1,300 feet west and 100 feet south of the northeast corner of sec. 16, T. 12 S., R. 19 E.

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sand; undisturbed, the dry soil has a salt-and-pepper appearance; single grained; loose; many fine and medium roots; moderately acid; clear smooth boundary.

E—5 to 17 inches; light brownish gray (10YR 6/2) fine sand; common fine and medium faint pale brown mottles; few pebble-sized ironstone nodules; single grained; loose; common fine and medium roots; strongly acid; abrupt smooth boundary.

Btg1—17 to 30 inches; dark gray (10YR 4/1) sandy clay; common medium and coarse faint very dark brown (10YR 3/2) and common medium and coarse prominent strong brown (7.5YR 5/6) and dark reddish brown (2.5YR 3/4) mottles; weak medium subangular blocky structure; friable; few fine and very fine roots; very strongly acid; diffuse wavy boundary.

Btg2—30 to 39 inches; dark gray (10YR 4/1) sandy clay; common fine and medium prominent dark red (2.5YR 3/6) and yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine and very fine roots; very strongly acid; diffuse wavy boundary.

Btg3—39 to 50 inches; gray (10YR 5/1) sandy clay; common medium and coarse prominent strong brown (7.5YR 5/6) and reddish brown (5YR 4/4) mottles; few fine and medium chalky phosphatic accumulations; moderate medium subangular blocky structure; friable; few fine and very fine roots; very strongly acid; diffuse wavy boundary.

Btg4—50 to 70 inches; gray (10YR 5/1) sandy clay loam; common medium and coarse prominent light yellowish brown (2.5Y 6/4) and few fine prominent dark brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; friable; few fine and very fine roots; very strongly acid; gradual wavy boundary.

Cg—70 to 80 inches; gray (5Y 6/1) sandy clay; common fine and medium faint light gray (5Y 7/2) and few fine prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable, sticky and plastic; very strongly acid.

The solum ranges from 50 to more than 80 inches in thickness. Reaction ranges from extremely acid to moderately acid throughout the profile. Some pedons have as much as 5 percent gravel-sized chert fragments or ironstone nodules in the upper part of the solum.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 to 4 and chroma of 0 to 2. It ranges from 4 to 6 inches in thickness.

The E horizon has hue of 10YR or is neutral in hue. It has value of 5 to 7 and chroma of 0 to 2. In some pedons it has mottles and streaks in shades of brown. It is less than 14 inches thick. The combined thickness of the A and E horizons is less than 20 inches.

The Btg horizon has hue of 10YR or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. It has mottles in shades of gray, brown, yellow, or red. It is sandy clay in the upper part and sandy clay loam or sandy clay in the lower part. The content of clay in the upper 20 inches of the Btg horizon ranges from 35 to 59 percent, by weighted average. The Btg horizon ranges from 30 to 65 inches in thickness.

Many pedons have a Cg horizon that has hue of 10YR to 5Y or is neutral in hue. It has value of 6 or 7 and chroma of 0 to 2. It is sandy clay loam, sandy clay, or clay.

Boca Series

The Boca series consists of moderately deep, poorly drained soils that formed in sandy and loamy marine sediments underlain by limestone. These soils are on low ridges and flatwoods. Slope ranges from 0 to 2 percent. The soils are loamy, siliceous, hyperthermic Arenic Ochraqualfs.

Boca soils are geographically associated with Aripeka, Broward, Chobee, Hallandale, Holopaw, Matmon, Moriah, Pineda, Waccasassa, and Wekiva soils. Aripeka, Broward, Matmon, and Moriah soils are somewhat poorly drained and are in the slightly higher landscape positions. Aripeka and Matmon soils have an argillic horizon within a depth of 20 inches. Moriah soils do not have limestone within a depth of 40 inches.

Broward soils do not have an argillic horizon. Chobee soils are very poorly drained, are in the lower landscape positions, and do not have limestone within a depth of 40 inches. Pineda soils do not have limestone within a depth of 40 inches. Hallandale, Matmon, and Waccasassa soils have limestone bedrock within a depth of 20 inches. Hallandale soils do not have an argillic horizon. Holopaw soils have a sandy epipedon that is more than 40 inches thick. Wekiva soils have a loamy argillic horizon within a depth of 20 inches.

Typical pedon of Boca fine sand, in an area of Boca-Holopaw, limestone substratum, complex; approximately 1,800 feet east and 1,700 feet north of the southwest corner of sec. 23, T. 14 S., R. 15 E.

Ap—0 to 5 inches; fine sand, black (10YR 2/1) rubbed; unrubbed, the mixture of coated and uncoated sand grains has a salt-and-pepper appearance; weak fine granular structure; very friable; many fine and very fine and common medium roots; neutral; clear wavy boundary.

E1—5 to 15 inches; light gray (10YR 7/1) fine sand; common medium faint light brownish gray (10YR 6/2) mottles; single grained; loose; many fine and very fine and common medium roots; mildly alkaline; diffuse wavy boundary.

E2—15 to 25 inches; light brownish gray (10YR 6/2) fine sand; common medium faint grayish brown (10YR 5/2) mottles; single grained; loose; many fine and very fine roots; neutral; clear wavy boundary.

EB—25 to 29 inches; brown (10YR 5/3) fine sand; common medium faint grayish brown (10YR 5/2) and common fine faint yellowish brown (10YR 5/4) mottles; single grained; loose; common very fine roots; mildly alkaline; abrupt wavy boundary.

Bt—29 to 37 inches; olive brown (2.5Y 4/4) sandy clay loam; many medium and coarse distinct yellowish brown (10YR 5/6) and faint dark yellowish brown (10YR 4/4) and common fine faint dark grayish brown (10YR 4/2) mottles; weak medium subangular blocky structure; very friable, slightly sticky and plastic; mildly alkaline.

2R—37 inches; limestone bedrock that can be dug with light power machinery.

The solum ranges from 24 to 40 inches in thickness. The depth to limestone bedrock dominantly ranges from 24 to 40 inches, but many pedons have solution holes that extend to a depth of more than 40 inches. Reaction ranges from strongly acid to moderately alkaline throughout.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. Matrix value is 4 at a depth of more than 8 inches. The A horizon ranges from 3 to 9 inches in thickness.

Many pedons have an E horizon that has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. Many pedons have an EB horizon underlying the A or E horizon. The EB horizon has hue of 10YR, value of 4 to 7, and chroma of 3 or 4. In some pedons it has mottles in shades of gray, brown, or yellow. It is fine sand or loamy fine sand. The combined thickness of the A, E, and EB horizons ranges from 20 to 36 inches.

The Bt horizon or the Btg horizon, if it occurs, has hue of 2.5Y, value of 4 to 6, and chroma of 4 or hue of 10YR, value of 4 to 6, and chroma of 2. It has mottles in shades of gray, brown, or yellow. It is fine sandy loam or sandy clay loam. In many pedons the content of gravel- to stone-sized limestone fragments is as much as 5 percent. This horizon ranges from 4 to 19 inches in thickness.

Bonneau Series

The Bonneau series consists of very deep, moderately well drained soils that formed in sandy and loamy marine sediments. These soils are on uplands. Slope ranges from 1 to 5 percent. The soils are loamy, siliceous, thermic Arenic Paleudults.

Bonneau soils are geographically associated with Astatula, Apopka, Candler, Lochloosa, Millhopper, Orlando, Sparr, and Tavares soils. Astatula, Candler, Orlando, and Tavares soils are sandy to a depth of more than 80 inches. Astatula and Candler soils are excessively drained. Apopka soils do not have an argillic horizon within a depth of 40 inches. Lochloosa and Sparr soils are somewhat poorly drained. Millhopper and Sparr soils do not have an argillic horizon within a depth of 40 inches.

Typical pedon of Bonneau fine sand, in an area of Millhopper-Bonneau complex, 1 to 5 percent slopes; approximately 1,200 feet west and 250 feet north of the southeast corner of sec. 2, T. 14 S., R. 18 E.

Ap—0 to 7 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; moderately acid; clear wavy boundary.

E—7 to 29 inches; pale brown (10YR 6/3) fine sand; single grained; loose; moderately acid; abrupt wavy boundary.

Bt1—29 to 37 inches; light yellowish brown (10YR 6/4) sandy clay loam; many medium prominent reddish yellow (7.5YR 6/8 and 7/8) mottles; weak fine subangular blocky structure; very friable; strongly acid; gradual wavy boundary.

Bt2—37 to 60 inches; light yellowish brown (10YR 6/4) fine sandy loam; many medium prominent reddish yellow (7.5YR 6/8 and 7/8) and common fine and medium distinct light gray (10YR 7/1) mottles; weak

fine subangular blocky structure; very friable; strongly acid; gradual wavy boundary.

C—60 to 80 inches; light gray (10YR 7/1) fine sandy loam; common medium prominent brownish yellow (10YR 6/6) and strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; very friable; moderately acid.

The solum is more than 60 inches thick. Reaction ranges from very strongly acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 4 to 9 inches in thickness.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. The combined thickness of the A and E horizons ranges from 20 to 39 inches.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The lower part has mottles in shades of gray within a depth of 60 inches. The Bt horizon is fine sandy loam or sandy clay loam. It is more than 20 inches thick.

The Btg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. It has mottles in shades of brown, yellow, or red. It is sandy clay loam or fine sandy loam. The depth to the Btg horizon is more than 55 inches.

Bradenton Series

The Bradenton series consists of very deep, poorly drained, frequently flooded soils that formed in sandy and loamy marine sediments. These soils are on flood plains along rivers and creeks. Slope ranges from 0 to 2 percent. The soils are coarse-loamy, siliceous, hyperthermic Typic Ochraqualfs.

Bradenton soils are geographically associated with Albany, Boca, Chobee, Gator, Holopaw, Myakka, Ousley, Pineda, Pompano, Waccasassa, and Wekiva soils. Albany and Ousley soils are somewhat poorly drained, are in the higher landscape positions, and have a sandy epipedon that is more than 40 inches thick. Chobee soils have a loamy mollic epipedon. Boca and Pineda soils have a sandy epipedon that is 20 to 40 inches thick. Boca soils have bedrock at a depth of 24 to 40 inches. Gator soils are in the lower landscape positions, are very poorly drained, and have a histic epipedon that is 16 to 51 inches thick. Holopaw soils have a sandy epipedon that is 40 to 79 inches thick. Myakka and Pompano soils are sandy to a depth of more than 80 inches. Myakka soils have a spodic horizon. Waccasassa soils have bedrock within a depth of 20 inches and have a loamy surface layer. Wekiva soils have bedrock at a depth of 10 to 30 inches.

Typical pedon of Bradenton fine sand, in an area of Chobee-Bradenton complex, frequently flooded; approximately 200 feet east and 100 feet north of the southwest corner of sec. 28, T. 12 S., R. 16 E.

A—0 to 4 inches; black (N 2/0) fine sand; weak medium granular structure; very friable; moderately acid; abrupt smooth boundary.

E—4 to 9 inches; light brownish gray (10YR 6/2) fine sand; weak fine granular structure; very friable; slightly acid; abrupt smooth boundary.

Btg1—9 to 18 inches; dark grayish brown (10YR 4/2) sandy clay loam; common medium prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; sticky and slightly plastic; slightly acid; clear wavy boundary.

Btg2—18 to 28 inches; grayish brown (10YR 5/2) fine sandy loam; common medium prominent strong brown (7.5YR 4/6) mottles; weak medium subangular blocky structure; slightly sticky and plastic; neutral; abrupt smooth boundary.

Cg1—28 to 32 inches; white (10YR 8/1) fine sandy loam; sand grains coated with carbonates; approximately 5 percent gravel-sized carbonate nodules; few fine prominent reddish yellow (7.5YR 6/6) mottles; massive; very friable; strongly effervescent in cold, dilute HCl; moderately alkaline; abrupt smooth boundary.

Cg2—32 to 48 inches; grayish brown (10YR 5/2) loamy fine sand; many fine and medium light gray (10YR 7/2) pockets and streaks of fine sand; massive; very friable; slightly effervescent; moderately alkaline; clear smooth boundary.

Cg3—48 to 80 inches; light gray (7.5YR 7/2) fine sand; single grained; loose; slightly effervescent; moderately alkaline.

The solum ranges from 20 to 50 inches in thickness. Reaction ranges from strongly acid to neutral in the A and E horizons and from slightly acid to moderately alkaline in the other horizons.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1, or it is neutral in hue and has value of 2 or 3. It ranges from 4 to 6 inches in thickness.

Many pedons have an E horizon that has hue of 10YR or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. In some pedons it has mottles in shades of gray or brown. It is sand or fine sand. The combined thickness of the A and E horizons is 6 to 20 inches.

The Bt horizon has hue of 10YR or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. It has mottles in shades of brown, yellow, or red. It is sandy loam, fine sandy loam, or sandy clay loam. In some pedons the content of gravel-sized limestone fragments

or nodules is as much as 1 percent. The Bt horizon ranges from 12 to 30 inches in thickness.

The Cg horizon has hue of 7.5YR to 5Y, value of 5 to 8, and chroma of 1 or 2. It is fine sand, fine sandy loam, or loamy fine sand.

Broward Series

The Broward series consists of moderately deep, somewhat poorly drained soils that formed in sandy marine sediments underlain by limestone. These soils are on low ridges. Slope ranges from 0 to 2 percent. The soils are hyperthermic, uncoated Aquic Quartzipsamments.

Broward soils are geographically associated with Adamsville, Boca, Bushnell, Hallandale, Jonesville, Lutterloh, Moriah, and Seaboard soils. Adamsville soils do not have limestone within a depth of 80 inches. Boca and Hallandale soils are poorly drained. Boca soils have a loamy argillic horizon, and Hallandale soils have limestone within a depth of 20 inches. Jonesville and Seaboard soils are in the slightly higher landscape positions and are better drained than the Broward soils. Jonesville soils have a loamy argillic horizon, and Seaboard soils have limestone within a depth of 20 inches. Bushnell soils have a clayey argillic horizon. Lutterloh and Moriah soils have a loamy argillic horizon and do not have limestone within a depth of 40 inches.

Typical pedon of Broward fine sand, in an area of Broward-Lutterloh, limestone substratum, complex; approximately 1,500 feet south and 600 feet east of the northwest corner of sec. 7, T. 13 S., R. 14 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand, gray (10YR 6/1) dry; weak fine granular structure; very friable; moderately alkaline; clear smooth boundary.

C1—6 to 10 inches; mottled light yellowish brown (10YR 6/4) and brownish yellow (10YR 6/6) fine sand; single grained; loose; moderately alkaline; gradual wavy boundary.

C2—10 to 25 inches; yellowish brown (10YR 5/4) fine sand; common fine faint yellowish brown (10YR 5/6) mottles; single grained; loose; moderately alkaline; abrupt wavy boundary.

2R—25 inches; white and very pale brown limestone bedrock that can be dug with light power machinery.

The depth to limestone bedrock dominantly ranges from 20 to 40 inches, but many pedons have solution holes that extend to a depth of more than 60 inches. Reaction ranges from moderately acid to moderately alkaline.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. It ranges from 3 to 8 inches in thickness.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 6. It has mottles in shades of gray, brown, or yellow. It is sand or fine sand.

The 2R horizon is white or very pale brown limestone bedrock that can be dug with light power machinery. Some pedons have a 2Cr horizon that overlies the bedrock. This horizon is soft, white, crumbly limestone that can be dug with difficulty with a spade. It is less than 12 inches thick. Some pedons have a thin, discontinuous Bt horizon in solution holes. This horizon is sandy loam. In many pedons the content of cobble- or stone-sized limestone fragments in the C or Cr horizon is as much as 2 percent.

Bushnell Series

The Bushnell series consists of moderately deep, somewhat poorly drained soils that formed in sandy and clayey marine sediments underlain by limestone. These soils are on uplands. Slope ranges from 0 to 5 percent. The soils are fine, mixed, thermic Albaquic Hapludalfs.

Bushnell soils are geographically associated with Jonesville, Levyville, Lutterloh, Mabel, Moriah, Otela, Pedro, Seaboard, and Shadeville soils. Shadeville and Jonesville soils are better drained than the Bushnell soils and have a sandy epipedon that is 20 to 40 inches thick. Shadeville soils do not have bedrock within a depth of 40 inches. Levyville soils are well drained and do not have bedrock within a depth of 40 inches. Lutterloh and Otela soils have a sandy epipedon that is more than 40 inches thick and do not have bedrock within a depth of 60 inches. Otela soils are moderately well drained. Mabel and Moriah soils do not have limestone within a depth of 40 inches. Moriah soils have a sandy epipedon that is 20 to 40 inches thick. Pedro and Seaboard soils are well drained and have limestone within a depth of 20 inches.

Typical pedon of Bushnell fine sand, in an area of Moriah-Bushnell-Mabel, limestone substratum, complex, 0 to 5 percent slopes; approximately 1,000 feet east and 1,200 feet north of the southwest corner of sec. 21, T. 13 S., R. 19 E.

A—0 to 6 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; many fine, medium, and coarse roots; very strongly acid; clear wavy boundary.

E—6 to 10 inches; brown (10YR 4/3) fine sand; common medium faint dark grayish brown (10YR 4/2) pockets and streaks; single grained; loose; common fine and medium roots; very strongly acid; abrupt wavy boundary.

Bt1—10 to 16 inches; yellowish brown (10YR 5/4) sandy clay; weak fine subangular blocky structure; friable, sticky and plastic; 1 or 2 percent chert

gravel; few fine and medium roots; very strongly acid; gradual wavy boundary.

Bt2—16 to 26 inches; yellowish brown (10YR 5/4) clay; common fine distinct gray (10YR 5/1) and grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; 1 or 2 percent chert gravel; few fine and medium roots; very strongly acid; abrupt wavy boundary.

2R—26 inches; very pale brown (10YR 7/3) and brownish yellow (10YR 6/6) limestone that can be chipped and dug with difficulty using a pick and shovel or light power machinery.

The thickness of the solum and the depth to limestone range from 20 to 40 inches. Reaction ranges from very strongly acid to slightly acid in the A and E horizons and from very strongly acid to moderately alkaline in the Bt horizon. The depth to the Bt horizon is less than 20 inches. Many pedons have gravel- to boulder-sized limestone or chert fragments on the surface or buried within the solum.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. If value is 3 and the A horizon directly overlies the Bt horizon, the A horizon is less than 6 inches thick. The A horizon generally ranges from 3 to 9 inches in thickness.

Most pedons have an E horizon that has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. This horizon is fine sand or loamy fine sand. It is less than 16 inches thick. The combined thickness of the A and E horizons ranges from 6 to 19 inches.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. It has mottles in shades of gray within a depth of 20 inches. It is dominantly sandy clay or clay, but the upper part may be sandy clay loam. The average content of clay in the upper 20 inches of the argillic horizon ranges from 35 to 60 percent. In many pedons a Btg horizon is at a depth of more than 20 inches. It has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is mottled in shades of red, yellow, or brown. It is sandy clay or clay. The combined thickness of the Bt and Btg horizons ranges from 4 to 34 inches.

The 2R horizon is limestone bedrock that can be dug with light power machinery. In some pedons a 2Cr horizon is above the 2R horizon at depths ranging from 20 to 40 inches. This horizon is white or pale brown, soft, crumbly limestone that can be dug with a spade. It commonly contains few to many harder limestone or chert fragments.

Candler Series

The Candler series consists of very deep, excessively drained soils that formed in sandy marine sediments. These soils are on uplands. Slope ranges from 1 to 8 percent. The soils are hyperthermic, uncoated Typic Quartzipsamments.

Candler soils are geographically associated with Apopka, Astatula, Millhopper, Orlando, Otela, and Tavares soils. Apopka soils are well drained and have a loamy argillic horizon within a depth of 80 inches. Astatula soils do not have lamellae within a depth of 80 inches. Orlando soils are 5 to 10 percent silt and clay between depths of 10 and 40 inches. They have an umbric epipedon. Millhopper and Otela soils are moderately well drained and have a loamy argillic horizon within a depth of 80 inches. Tavares soils are moderately well drained and do not have lamellae within a depth of 80 inches.

Typical pedon of Candler fine sand, in an area of Candler-Apopka complex, 1 to 5 percent slopes; approximately 1,950 feet west and 2,050 feet south of the northeast corner of sec. 4, T. 13 S., R. 17 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sand; common fine distinct light yellowish brown (10YR 6/4) horizontal bands; single grained; loose; few fine and medium roots; moderately acid; abrupt smooth boundary.

E1—8 to 19 inches; light yellowish brown (10YR 6/4) fine sand; few coarse distinct dark grayish brown (10YR 4/2) pockets and krotovinas; single grained; loose; few fine and very fine roots; moderately acid; gradual wavy boundary.

E2—19 to 37 inches; brownish yellow (10YR 6/6) fine sand; common fine and medium distinct light gray (10YR 7/2) pockets and streaks of uncoated sand grains; single grained; loose; few fine and very fine roots; moderately acid; gradual wavy boundary.

E3—37 to 52 inches; very pale brown (10YR 7/3) fine sand; few fine and medium distinct very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) pockets; few fine black fragments of charcoal; single grained; loose; few fine and very fine roots; moderately acid; gradual wavy boundary.

E&Bt—52 to 80 inches; very pale brown (10YR 8/3) fine sand (E); many fine and medium distinct brownish yellow (10YR 6/6) horizontal lenses and lamellae of loamy fine sand (Bt); single grained; loose; few fine and very fine roots; moderately acid.

The solum is more than 80 inches thick. Reaction ranges from very strongly acid to moderately acid throughout, except in areas that have been limed. The content of silt and clay in the 10- to 40-inch control section is less than 5 percent.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. It ranges from 2 to 8 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 6. In some pedons it has streaks and pockets in shades of gray or grayish brown. It is sand or fine sand. The combined thickness of the A and E horizons ranges from 40 to 78 inches.

The E part of the E&Bt horizon has hue of 10YR, value of 7 or 8, and chroma of 1 to 4. It is sand or fine sand. The Bt part of the E&Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. It is fine sand or loamy fine sand. Many pedons have a continuous argillic horizon at a depth of more than 80 inches. This horizon has colors similar to those of the Bt part of the E&Bt horizon. It is fine sandy loam.

Cassia Series

The Cassia series consists of very deep, somewhat poorly drained soils that formed in sandy marine sediments. These soils are on low ridges and knolls on flatwoods. Slope ranges from 0 to 2 percent. The soils are sandy, siliceous, hyperthermic Typic Haplohumods.

Cassia soils are geographically associated with Adamsville, Immokalee, Myakka, Orsino, Placid, Pomello, Pompano, Smyrna, and Zolfo soils. Adamsville soils do not have a spodic horizon. Immokalee, Pomello, and Zolfo soils have a spodic horizon that is at a depth of more than 30 inches. Immokalee, Myakka, Pompano, and Smyrna soils are in the slightly lower landscape positions and are poorly drained. Pompano soils do not have a spodic horizon. Orsino soils are in the higher landscape positions, are moderately well drained, and do not have a spodic horizon. Placid soils are in depressions, do not have a spodic horizon, and are very poorly drained.

Typical pedon of Cassia fine sand, in an area of Cassia-Pomello complex; approximately 2,700 feet south and 2,500 feet east of the northwest corner of sec. 24, T. 14 S., R. 16 E.

A—0 to 6 inches; fine sand, gray (10YR 5/1) rubbed; dry, the mixture of coated and uncoated sand grains has a salt-and-pepper appearance; single grained; loose; common fine and very fine and few medium roots; very strongly acid; clear smooth boundary.

E1—6 to 19 inches; light gray (10YR 7/1) fine sand; common medium faint light brownish gray (10YR 6/2) pockets and streaks; single grained; loose; few fine and very fine and few medium roots; slightly acid; clear wavy boundary.

E2—19 to 24 inches; light gray (10YR 7/1) fine sand; common medium distinct dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) and few fine prominent very dark grayish brown (10YR 3/2) mottles; single grained; loose; few fine and very fine roots; slightly acid; clear wavy boundary.

Bh1—24 to 30 inches; very dark brown (10YR 2/2) fine sand; many medium and coarse dark brown (7.5YR 3/2) mottles and streaks; few medium and coarse light gray (10YR 7/1) pockets; weak fine subangular blocky structure; very friable; few fine and very fine roots; slightly acid; gradual wavy boundary.

Bh2—30 to 55 inches; dark brown (7.5YR 4/4) fine sand; common fine and medium faint very dark grayish brown (10YR 3/2) pockets and streaks; single grained; loose; slightly acid; diffuse wavy boundary.

E′—55 to 70 inches; brown (10YR 5/3) fine sand; common fine and medium faint dark brown (10YR 3/3) mottles; single grained; loose; slightly acid; diffuse wavy boundary.

Bh′—70 to 80 inches; very dark grayish brown (10YR 3/2) fine sand; many medium and coarse faint dark brown (10YR 3/3) mottles; single grained; loose; slightly acid.

The solum ranges from 20 to more than 80 inches in thickness. Reaction ranges from very strongly acid to slightly acid throughout the profile.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 1. It ranges from 2 to 6 inches in thickness.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. In some pedons it has mottles in shades of brown or gray. It is sand or fine sand. The combined thickness of the A and E horizons ranges from 15 to 30 inches.

The Bh horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 to 4 and chroma of 0 to 3. It is sand or fine sand. It ranges from 9 to more than 35 inches in thickness.

Many pedons have an E′ and a Bh′ horizon. The E′ horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4 or value of 6 or 7 and chroma of 2. The Bh′ horizon has value of 2 or 3 and chroma of 1 or 2. The E′ and Bh′ horizons are sand or fine sand.

Chobee Series

The Chobee series consists of deep or very deep, very poorly drained, frequently flooded soils that formed in loamy alluvial sediments. These soils are on flood plains along rivers and creeks. Slope is 0 or 1 percent. The soils are fine-loamy, siliceous, hyperthermic Typic Argiaquolls.

Chobee soils are geographically associated with Aripeka, Boca, Bradenton, Demory, Gator, Hicoria, Holopaw, Matmon, Pineda, Popash, Waccasassa, and Wekiva soils. Aripeka and Matmon soils are in the higher landscape positions and are somewhat poorly drained. Boca, Demory, Waccasassa, and Wekiva soils are in the slightly higher landscape positions, are poorly

drained, and have limestone bedrock within a depth of 40 inches. Pineda, Hicoria, Holopaw, and Popash soils are sandy to a depth of more than 20 inches. Gator soils have a histic epipedon that is 16 to 51 inches thick. Bradenton soils are poorly drained and have a sandy epipedon that is 6 to 20 inches thick.

Typical pedon of Chobee fine sandy loam, limestone substratum, frequently flooded, approximately 1,300 feet west and 1,500 feet south of the northeast corner of sec. 29, T. 14 S., R. 16 E.

Oa—0 to 3 inches; very dark brown (10YR 2/2) muck; massive; nonsticky and nonplastic; many fine and medium and common coarse roots; mildly alkaline; gradual wavy boundary.

A—3 to 11 inches; very dark brown (10YR 2/2) fine sandy loam; massive; slightly sticky and plastic; common fine and medium and few coarse roots; mildly alkaline; gradual irregular boundary.

Btg1—11 to 21 inches; very dark grayish brown (10YR 3/2) sandy clay loam; weak medium subangular blocky structure; many fine and medium distinct grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) mottles and streaks of fine sand; slightly sticky and slightly plastic; common fine and medium and few coarse roots; mildly alkaline; clear smooth boundary.

Btg2—21 to 28 inches; light brownish gray (10YR 6/2) sandy clay loam; weak medium subangular blocky structure; common fine and very fine and few medium roots; sticky and plastic; mildly alkaline; gradual smooth boundary.

Btg3—28 to 48 inches; dark greenish gray (5GY 4/1) sandy clay loam; few fine prominent light brownish gray (10YR 6/2) pockets of shell fragments and calcium carbonate accumulations; common fine prominent dark yellowish brown (10YR 4/6) stains and mottles; weak coarse subangular blocky structure; sticky and plastic; common fine and very fine and few medium roots; mildly alkaline; diffuse irregular boundary.

Btg4—48 to 54 inches; dark greenish gray (5GY 4/1) sandy clay loam; common medium and coarse distinct light gray (5Y 7/1) pockets and lenses of fine sand; weak coarse subangular blocky structure; slightly sticky and slightly plastic; few fine and very fine roots; mildly alkaline; gradual wavy boundary.

Btkg—54 to 68 inches; greenish gray (5GY 5/1) and light greenish gray (5GY 6/1) sandy clay loam; many coarse prominent light gray (10YR 7/2) pockets of calcium carbonate accumulations; massive; slightly sticky and slightly plastic; mildly alkaline; abrupt irregular boundary.

2R—68 inches; limestone bedrock that can be dug with light power machinery.

The thickness of the solum and the depth to limestone bedrock are more than 40 inches. Reaction ranges from slightly acid to mildly alkaline in the A horizon and from slightly acid to moderately alkaline in the other layers.

The Oa horizon, if it occurs, has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 or 2. It is less than 4 inches thick.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It ranges from 4 to 19 inches in thickness.

The Btg and Btkg horizons have hue of 10YR to 5GY, value of 3 to 6, and chroma of 1 or 2. They are fine sandy loam or sandy clay loam. The average content of clay in the upper 20 inches of the argillic horizon ranges from 18 to 35 percent.

Many pedons have a 2C horizon that is fine sand.

Many pedons have a Cg horizon at a depth of more than 40 inches. The Cg horizon has hue of 10YR to 5GY, value of 4 to 7, and chroma of 1. It has mottles in shades of brown or yellow. In some pedons it has pockets or lenses of shell fragments. It is loamy fine sand or fine sandy loam.

Cracker Series

The Cracker series consists of shallow or very shallow, very poorly drained, frequently flooded, strongly saline soils that formed in dominantly loamy marine sediments underlain by limestone. These soils are in areas of tidal marsh. Slope is 0 or 1 percent. The soils are loamy, siliceous, thermic Lithic Haplaquolls.

Cracker soils are geographically associated with Demory and Tidewater soils. Demory soils are in the slightly higher landscape positions, are poorly drained, and are not subject to flooding by normal high tides. Tidewater soils have sulfidic materials within a depth of 20 inches and do not have bedrock within a depth of 40 inches.

Typical pedon of Cracker mucky clay, frequently flooded, approximately 2,700 feet east and 3,000 feet south of the northwest corner of sec. 3, T. 16 S., R. 15 E.

A1—0 to 4 inches; black (10YR 2/1) mucky clay; massive; slightly sticky and nonplastic; neutral; clear wavy boundary.

A2—4 to 12 inches; very dark gray (2.5Y 3/0) sandy clay loam; massive; slightly sticky and slightly plastic; neutral; abrupt irregular boundary.

2R—12 inches; limestone bedrock that can be dug with light power machinery.

The depth to limestone bedrock ranges from 6 to 20 inches. Reaction is slightly acid or neutral throughout the profile. Total sulfur content is less than 0.75 percent, and n-values are less than 0.7 throughout the profile.

The A horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. The A1 horizon ranges from 4 to 10 inches in thickness. The A2 horizon is sandy clay loam, clay loam, or fine sandy loam. The total thickness of the A horizon ranges from 6 to 20 inches. In many pedons an Oa horizon is at the surface. This horizon has hue of 10YR or is neutral in hue. It has value of 2 and chroma of 0 to 2. It is muck. It is less than 3 inches thick.

Some pedons have a Cg horizon at a depth of more than 10 inches. This horizon has hue of 10YR to 5GY or is neutral in hue. It has value of 4 or 5 and chroma of 0 to 2. It is mottled in shades of brown, yellow, or olive. It is fine sandy loam, clay loam, or sandy clay loam.

Demory Series

The Demory series consists of shallow or very shallow, poorly drained, rarely flooded or occasionally flooded soils that formed in loamy marine sediments underlain by limestone. These soils are on low ridges of the coastal limestone shelf that are adjacent to or surrounded by areas of tidal marsh. Slope ranges from 0 to 2 percent. The soils are loamy, siliceous, hyperthermic Lithic Haplaquolls.

Demory soils are geographically associated with Chobee, Cracker, Tidewater, Waccasassa, and Wekiva soils. Chobee and Tidewater soils are very poorly drained and do not have bedrock within a depth of 40 inches. Tidewater and Cracker soils are flooded by normal high tides. Cracker soils are very poorly drained. Waccasassa and Wekiva soils do not have a mollic epipedon. Wekiva soils have a sandy epipedon that is 7 to 19 inches thick.

Typical pedon of Demory sandy clay loam, occasionally flooded, approximately 2,500 feet east and 1,000 feet south of the northwest corner of sec. 12, T. 15 S., R. 14 E.

Oa—0 to 3 inches; black (10YR 2/1) muck; weak medium granular structure; very friable; many fine and medium and few coarse roots; neutral; clear wavy boundary.

A—3 to 7 inches; very dark grayish brown (10YR 3/2) sandy clay loam; weak medium granular structure; friable; few fine and medium roots; neutral; clear wavy boundary.

C—7 to 9 inches; dark grayish brown (10YR 4/2) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; neutral; abrupt irregular boundary.

2R—9 inches; limestone bedrock that has an irregular surface that can be dug with light power machinery.

The depth to bedrock ranges from 4 to 20 inches. Reaction is slightly acid or neutral throughout the profile. In some areas gravel- or cobble-sized limestone fragments are throughout the profile.

The Oa horizon has hue of 10YR, value of 2 or 3, and chroma of 1. It is less than 3 inches thick.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 3. Some pedons have a thin layer at the surface that is fine sand, loamy fine sand, or fine sandy loam. This layer is less than 3 inches thick. When mixed to a depth of 7 inches or to lithic contact if at a depth of less than 7 inches, the soil is finer than loamy fine sand and meets mollic color and chemical criteria. The A horizon ranges from 4 to 19 inches in thickness.

The C horizon, if it occurs, has hue of 10YR or 2.5YR, value of 4 or 5, and chroma of 1 to 6. It is fine sandy loam or sandy clay loam. It is less than 7 inches thick.

The 2R horizon is limestone bedrock that has a smooth to irregular surface. It has solution holes that extend to a depth of more than 20 inches.

EauGallie Series

The EauGallie series consists of deep or very deep, poorly drained soils that formed in sandy and loamy marine sediments underlain by limestone. They are on flatwoods. Slope ranges from 0 to 2 percent. The soils are sandy, siliceous, hyperthermic Alfic Haplaquods.

EauGallie soils are geographically associated with Boca, Hicoria, Holopaw, Immokalee, Janney, Myakka, Pineda, Placid, Pompano, and Popash soils. Boca, Pineda, and Holopaw soils do not have a spodic horizon. Boca and Pineda soils have an argillic horizon at depths ranging from 20 to 40 inches and Boca soils have bedrock within a depth of 40 inches. Hicoria, Placid, and Popash soils do not have a spodic horizon, have an umbric epipedon, and are very poorly drained. Janney soils have bedrock at depths ranging from 20 to 40 inches. Janney, Immokalee, and Myakka soils do not have an argillic horizon. Pompano soils are sandy to a depth of more than 80 inches and do not have a spodic horizon.

Typical pedon of EauGallie fine sand, in an area of EauGallie-Holopaw complex, limestone substratum; approximately 1,300 feet west and 600 feet south of the northeast corner of sec. 32, T. 13 S., R. 14 E.

Ap—0 to 6 inches; fine sand, very dark gray (10YR 3/1)

rubbed; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

E—6 to 16 inches; gray (10YR 5/1) fine sand; many medium faint dark gray (10YR 4/1) pockets and streaks; single grained; loose; common fine and medium roots; moderately acid; clear wavy boundary.

Bh—16 to 19 inches; black (10YR 2/1) fine sand; sand grains well coated with colloidal organic matter; weak fine subangular blocky structure; very friable; common fine and medium roots; strongly acid; clear wavy boundary.

BE1—19 to 25 inches; brown (10YR 4/3) fine sand; many medium and coarse faint dark grayish brown (10YR 4/2) mottles; single grained; loose; few fine and very fine roots; moderately acid; gradual wavy boundary.

BE2—25 to 35 inches; yellowish brown (10YR 5/4) fine sand; common medium faint dark yellowish brown (10YR 4/4) mottles; single grained; loose; few fine and very fine roots; moderately acid; diffuse wavy boundary.

E′—35 to 55 inches; very pale brown (10YR 7/3) fine sand; common fine and medium faint light brownish gray (10YR 6/2) mottles; single grained; loose; few fine and very fine roots; neutral; abrupt wavy boundary.

Btg—55 to 61 inches; gray (5Y 6/1) fine sandy loam; common fine and medium prominent light olive brown (2.5Y 5/4) mottles; weak fine subangular blocky structure; slightly sticky and nonplastic; few fine and very fine roots; mildly alkaline; abrupt irregular boundary.

2R—61 inches; very pale brown and light gray limestone bedrock.

The thickness of the solum and the depth to bedrock range from 50 to 80 inches. The depth to the Btg horizon is more than 40 inches.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. Reaction ranges from very strongly acid to moderately acid, except in areas that have been limed. The A horizon ranges from 3 to 10 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Reaction ranges from very strongly acid to moderately acid. The combined thickness of the A and E horizons ranges from 15 to 29 inches.

The Bh horizon has hue of 10YR or is neutral in hue and has value of 2 or 3 and chroma of 0 to 3, or it has hue of 7.5YR or is neutral in hue and has value of 3 and chroma of 0 to 2. Sand grains are well coated with colloidal organic matter. The texture is fine sand or loamy fine sand. Reaction ranges from very strongly acid to slightly acid. The Bh horizon ranges from 2 to 20 inches in thickness.

Many pedons have a BE and an E′ horizon. The BE horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. The E′ horizon has hue of 10YR, value of 6 or 7, and chroma of 1 to 3. Reaction ranges from strongly acid to mildly alkaline in both horizons.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 3. It has mottles in shades of brown, yellow, and gray. Reaction ranges from strongly acid to mildly alkaline. The texture is fine sandy loam or sandy clay loam. The average content of clay ranges from 13 to 31 percent in the upper 20 inches. The Btg horizon ranges from 5 to more than 30 inches in thickness.

In many pedons the content of cobble- or stone-sized limestone fragments that overlie the 2R horizon is as much as 2 percent.

Ft. Green Series

The Ft. Green series consists of very deep, poorly drained soils that formed in sandy and loamy marine sediments. These soils are on side slopes on uplands. Slope ranges from 2 to 5 percent. The soils are loamy, siliceous, hyperthermic Arenic Ochraqualfs.

Ft. Green soils are geographically associated with Adamsville, Bivans, Hicoria, Holopaw, Lochloosa, Mabel, Micanopy, Popash, Sparr, and Tavares soils. Adamsville and Tavares soils are sandy to a depth of more than 80 inches and are better drained than the Ft. Green soils. Bivans soils have a sandy epipedon that is less than 20 inches thick. Hicoria and Popash soils are very poorly drained, are in the lower landscape positions, and have an umbric epipedon. Holopaw soils are in the lower landscape positions and have a sandy epipedon that is more than 40 inches thick. Lochloosa, Mabel, Micanopy, and Sparr soils are somewhat poorly drained. Mabel and Micanopy soils have a sandy epipedon that is less than 20 inches thick, and Sparr soils have a sandy epipedon that is more than 40 inches thick.

Typical pedon of Ft. Green fine sand, in an area of Ft. Green-Bivans complex, 2 to 5 percent slopes; approximately 1,200 feet south and 200 feet east of the northwest corner of sec. 4, T. 12 S., R. 19 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; many fine and very fine and common medium roots; extremely acid; clear wavy boundary.

E—7 to 28 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; few fine and very fine roots; very strongly acid; clear wavy boundary.

E/B—28 to 33 inches; brown (10YR 5/3) loamy fine

sand (E); many medium and coarse very dark grayish brown (10YR 3/2) pockets of fine sandy loam (Bt); when mixed, the horizon is loamy fine sand; approximately 1 percent gravel-sized chert fragments; weak fine subangular blocky structure; very friable; few fine and very fine roots; very strongly acid; clear wavy boundary.

Btg1—33 to 46 inches; light brownish gray (10YR 6/2) fine sandy loam; few coarse prominent strong brown (7.5YR 4/6) and few medium and coarse faint grayish brown (10YR 5/2) mottles; approximately 1 percent gravel-sized chert fragments; weak fine subangular blocky structure; very friable, slightly sticky and slightly plastic; few fine and very fine roots; very strongly acid; clear wavy boundary.

Btg2—46 to 60 inches; dark gray (10YR 4/1) sandy clay loam; few fine prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; thin clay skins on some peds; sticky and plastic; few fine and very fine roots; very strongly acid; gradual irregular boundary.

Btg3—60 to 67 inches; light greenish gray (5GY 7/1) and gray (5Y 6/1) sandy clay loam; common fine prominent strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; sticky and plastic; strongly acid; gradual irregular boundary.

Btg4—67 to 80 inches; light gray (5Y 7/1) and gray (5Y 6/1) sandy clay loam; common fine and medium prominent very dark gray (10YR 3/1) vertical streaks around dead roots; moderate medium subangular blocky structure; sticky and plastic; moderately acid.

The solum is more than 80 inches thick. Reaction ranges from extremely acid to slightly acid in the A horizon and from very strongly acid to slightly acid in the E and Btg horizons.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 3 to 7 inches in thickness.

The E horizon has hue of 10YR, value of 4 to 7, and chroma of 1 to 3. In some pedons it has mottles in shades of yellow or brown. It ranges from 14 to 39 inches in thickness.

The Btg horizon has hue of 10YR to 5GY or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. It has mottles in shades of brown, yellow, red, or olive. In some pedons the content of gravel- to stone-sized limestone or chert fragments is as much as 5 percent. The average content of clay is less than 35 percent in the upper 20 inches. The texture is fine sandy loam or sandy clay loam.

Gator Series

The Gator series consists of very deep, very poorly drained, frequently flooded soils that formed in thick deposits of hydrophytic plant remains underlain by loamy sediments. These soils are in depressions on flatwoods and on flood plains along rivers and creeks. Slope is 0 or 1 percent. The soils are loamy, siliceous, euic, hyperthermic Terric Medisaprists.

Gator soils are geographically associated with Bradenton, Chobee, Hicoria, Pineda, Placid, Popash, Samsula, Terra Ceia, Tidewater, and Wulfert soils. Chobee, Hicoria, Placid, Pineda, Popash, and Bradenton soils do not have a histic epipedon. Pineda and Hicoria soils are sandy to a depth of 20 to 40 inches, and Placid and Popash soils are sandy to a depth of more than 40 inches. Pineda and Bradenton soils are in the slightly higher landscape positions and are poorly drained. Samsula soils have sandy material underlying the histic epipedon that extends to a depth of more than 80 inches. Tidewater and Wulfert soils are flooded by high tides. In some pedons Tidewater soils have a histic epipedon that is less than 16 inches thick.

Typical pedon of Gator muck, in an area of Chobee-Gator complex, frequently flooded; approximately 2,000 feet east and 50 feet south of the northwest corner of sec. 21, T. 12 S., R. 16 E.

Oa—0 to 26 inches; black (10YR 2/1) muck; massive; nonsticky and nonplastic; mildly alkaline; clear smooth boundary.

C—26 to 40 inches; very dark gray (10YR 3/1) fine sandy loam; massive; sticky and slightly plastic; mildly alkaline; clear smooth boundary.

Cg1—40 to 52 inches; gray (5Y 5/1) sandy clay loam; massive; sticky and plastic; mildly alkaline; clear smooth boundary.

Cg2—52 to 80 inches; light gray (10YR 7/1) fine sand; common medium prominent olive brown (2.5Y 4/4) mottles; single grained; loose; mildly alkaline.

The Oa horizon has hue of 10YR to 5YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. The content of fiber is less than 16 percent, rubbed. Reaction is more than pH 4.5 in 0.01 M $CaCl_2$. The Oa horizon ranges from 16 to 51 inches in thickness.

The C horizon has hue of 10YR to 5Y, value of 2 or 3, and chroma of 1 or 2. The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. In some pedons it has mottles in shades of brown. The texture is dominantly sandy loam, fine sandy loam, or sandy clay loam in the upper part of the horizon and sand, fine sand, or loamy fine sand in the lower part, or the horizon is stratified with these textures. Some pedons have a layer of fine sand or loamy fine sand

underlying the Oa horizon. This layer is less than 12 inches thick. It is underlain by finer textured material. Some pedons have shell fragments or soft calcium carbonate accumulations within the C horizon. Reaction ranges from slightly acid to moderately alkaline in the C and Cg horizons.

Hague Series

The Hague series consists of very deep, well drained soils that formed in sandy and loamy marine sediments. These soils are on uplands. Slope ranges from 0 to 2 percent. The soils are loamy, siliceous, hyperthermic Arenic Hapludalfs.

Hague soils are geographically associated with Candler, Levyville, Lochloosa, Millhopper, Otela, Pender, Placid, Popash, Sparr, and Tavares soils. Candler and Tavares soils are sandy to a depth of more than 80 inches. Levyville and Pender soils have a loamy argillic horizon that is within a depth of 20 inches. Pender and Lochloosa soils are somewhat poorly drained and are in the slightly lower landscape positions. Millhopper, Otela, and Sparr soils have a loamy argillic horizon at a depth of 40 to 80 inches. Sparr soils are somewhat poorly drained and are in slightly lower landscape positions. Placid and Popash soils are very poorly drained and are in depressions.

Typical pedon of Hague fine sand, in an area of Levyville-Hague complex; approximately 2,100 feet east and 2,700 feet north of the southwest corner of sec. 8, T. 12 S., R. 15 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; moderately acid; clear smooth boundary.

E—7 to 24 inches; yellowish brown (10YR 5/4) fine sand; common fine and medium faint yellowish brown (10YR 5/6) and light yellowish brown (10YR 6/4) pockets and streaks; single grained; loose; moderately acid; abrupt smooth boundary.

Bt1—24 to 36 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; very strongly acid; diffuse wavy boundary.

Bt2—36 to 50 inches; yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) fine sandy loam; few fine and medium faint strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

BC—50 to 60 inches; yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) loamy fine sand; weak fine subangular blocky structure; very friable; very strongly acid; gradual wavy boundary.

C—60 to 80 inches; very pale brown (10YR 8/3) fine sand; many medium distinct brownish yellow (10YR 6/6) pockets of loamy sand; massive; very friable; very strongly acid.

The solum ranges from 60 to more than 80 inches in thickness. Reaction ranges from very strongly acid to moderately acid throughout the profile.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. It ranges from 6 to 10 inches in thickness. In some pedons the content of gravel- to stone-sized limestone fragments on the surface or buried within the solum is as much as 2 percent.

The E horizon has hue of 10YR or 7.5YR, value of 4 to 7, and chroma of 3 to 6.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 4 to 8.

The BC horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 6 to 8. The C horizon, if it occurs, has hue of 10YR or 7.5YR or is neutral in hue. It has value of 7 or 8 and chroma of 0 to 4. In some pedons it has pockets of finer textured material or mottles in shades of yellow or brown.

Hallandale Series

The Hallandale series consists of shallow or very shallow, poorly drained soils that formed in sandy marine sediments underlain by limestone. These soils are on low ridges. Slope ranges from 0 to 2 percent. The soils are siliceous, hyperthermic, Lithic Psammaquents.

Hallandale soils are geographically associated with Adamsville, Boca, Broward, Chobee, Hicoria, Holopaw, Janney, Pineda, Pompano, Popash, and Wekiva soils. Adamsville, Boca, Broward, Chobee, Hicoria, Holopaw, Janney, Pineda, Pompano, and Popash soils are more than 20 inches deep over limestone bedrock. Adamsville and Broward soils are somewhat poorly drained and are in the higher landscape positions. Chobee, Hicoria, and Popash soils are very poorly drained and are in the lower landscape positions. Boca, Pineda, and Holopaw soils have a loamy argillic horizon at a depth of more than 20 inches. Wekiva soils have a loamy argillic horizon within a depth of 20 inches. Janney soils have a spodic horizon.

Typical pedon of Hallandale fine sand, in an area of Hallandale-Boca-Holopaw complex; approximately 2,200 feet east and 1,600 feet north of the southwest corner of sec. 33, T. 16 S., R. 16 E.

Ap—0 to 4 inches; light gray (10YR 6/1) fine sand; weak fine granular structure; very friable; strongly acid; clear wavy boundary.

E—4 to 12 inches; white (10YR 8/2) fine sand; few fine and medium distinct brown (10YR 5/3) mottles;

single grained; loose; moderately acid; gradual wavy boundary.

Bw—12 to 19 inches; very pale brown (10YR 7/3) fine sand; few medium faint brown (10YR 5/3) mottles; single grained; loose; moderately acid; abrupt wavy boundary.

2R—19 inches; white (10YR 8/2) and very pale brown (10YR 7/3) limestone bedrock that can be dug with light power machinery. In adjacent pedons the depth to limestone ranges from 5 to 24 inches.

The depth to bedrock dominantly ranges from 7 to 20 inches, but many pedons have solution holes that extend to a depth of more than 40 inches and have rock outcrops. Reaction ranges from strongly acid to slightly acid in the A horizon and from moderately acid to moderately alkaline in the E and Bw horizons.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 1. It ranges from 2 to 7 inches in thickness.

Most pedons have an E&Bw horizon. The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The Bw horizon has value of 5 to 7 and chroma of 3. It has mottles in shades of brown or gray. Some pedons do not have an E or Bw horizon. These pedons have a C horizon below the A horizon and above the limestone. The C horizon has hue of 10YR, value of 5 or 6, and chroma of 1 to 3.

Some pedons have a discontinuous Bt horizon. This horizon is within solution holes or occurs as thin lenses above the bedrock. It is sandy loam or sandy clay loam.

Hicoria Series

The Hicoria series consists of very deep, poorly drained and very poorly drained soils that formed in sandy and loamy marine sediments. These soils are on low flats and in depressions. Slope ranges from 0 to 2 percent. The soils are loamy, siliceous, hyperthermic Typic Umbraqualfs.

Hicoria soils are geographically associated with Chobee, Ft. Green, Holopaw, Pineda, Placid, Pompano, Popash, Samsula, and Wauchula soils. Ft. Green, Holopaw, Pineda, and Pompano soils do not have an umbric epipedon. Ft. Green soils are in the higher landscape positions. Holopaw soils do not have an argillic horizon within a depth of 40 inches. Popash soils do not have an argillic horizon within a depth of 40 inches. Placid and Pompano soils are sandy to a depth of more than 80 inches. Chobee soils have a loamy mollic epipedon. Samsula soils have a histic epipedon that ranges from 16 to 51 inches in thickness. Wauchula soils have a spodic horizon and are in the slightly higher landscape positions.

Typical pedon of Hicoria fine sand, approximately 1,900 feet east and 1,100 feet north of the southwest corner of sec. 8, T. 12 S., R. 19 E.

Ap—0 to 11 inches; very dark gray (10YR 3/1) fine sand, brown (10YR 5/3) dry; weak fine granular structure; very friable; common fine and very fine roots; strongly acid; gradual wavy boundary.

A—11 to 17 inches; very dark grayish brown (10YR 3/2) fine sand, grayish brown (10YR 5/2) dry; few medium and coarse faint very dark gray (10YR 3/1) pockets; single grained; loose; few fine and very fine roots; strongly acid; gradual wavy boundary.

Eg—17 to 23 inches; grayish brown (10YR 5/2) loamy fine sand; common fine faint yellowish brown (10YR 5/4) mottles; single grained; loose; few fine and very fine roots; very strongly acid; clear wavy boundary.

Btg1—23 to 30 inches; grayish brown (10YR 5/2) sandy clay loam; many fine prominent strong brown (7.5YR 4/6) mottles and vertical streaks; weak fine subangular blocky structure; friable; few fine and very fine roots; very strongly acid; gradual wavy boundary.

Btg2—30 to 41 inches; gray (10YR 5/1) sandy clay loam; many medium and coarse prominent red (2.5YR 4/6) and strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable; few fine and very fine roots; very strongly acid; diffuse wavy boundary.

Btg3—41 to 60 inches; gray (10YR 5/1) sandy clay loam; common fine and medium prominent strong brown (7.5YR 4/6 and 5/6) mottles; weak fine subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Btg4—60 to 80 inches; gray (10YR 5/1) sandy clay loam; common fine and medium prominent strong brown (7.5YR 4/6 and 5/6) mottles; moderate coarse subangular blocky structure; very friable; extremely acid.

The solum ranges from 60 to more than 80 inches in thickness. Reaction ranges from extremely acid to slightly acid in the A horizon and from extremely acid to neutral in the Eg and Btg horizons.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sand or loamy fine sand. It ranges from 10 to 24 inches in thickness. In some pedons an Oa horizon is at the surface. This horizon is muck. It has colors similar to those of the A horizon. It is less than 3 inches thick.

The Eg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. In some pedons it has mottles in shades of brown or streaks and pockets of material with colors similar to those of the A horizon. The Eg horizon

is fine sand or loamy fine sand. It is less than 28 inches thick.

The Btg horizon has hue of 10YR to 5Y, value of 5 or 6, and chroma of 1 or 2. It has mottles in shades of brown, yellow, or red. It is fine sandy loam or sandy clay loam. It ranges from 10 to 60 inches in thickness. Some pedons have a Cg horizon that has colors similar to those of the Btg horizon. The Cg horizon is fine sand or loamy fine sand.

Holopaw Series

The Holopaw series consists of deep and very deep, poorly drained soils that formed in sandy and loamy marine sediments. These soils are on sloughs on flatwoods and on broad, low flats and flood plains. They are subject to rare, occasional, or frequent flooding in some areas. Slope ranges from 0 to 2 percent. The soils are loamy, siliceous, hyperthermic Grossarenic Ochraqualfs.

Holopaw soils are geographically associated with Boca, EauGallie, Ft. Green, Hallandale, Hicoria, Pineda, Placid, Pompano, and Popash soils. Boca, Ft. Green, and Pineda soils have an argillic horizon within a depth of 40 inches. Boca soils have limestone at depths of 24 to 40 inches. EauGallie soils have a spodic horizon. Hicoria, Placid, and Popash soils are very poorly drained, are in depressions, and have an umbric epipedon. Hicoria soils have an argillic horizon within a depth of 40 inches, and Placid soils are sandy to a depth of more than 80 inches. Hallandale and Pompano soils do not have an argillic horizon. Hallandale soils have limestone within a depth of 20 inches.

Typical pedon of Holopaw fine sand, approximately 2,300 feet east and 1,700 feet south of the northwest corner of sec. 35, T. 13 S., R. 18 E.

Ap—0 to 3 inches; fine sand, very dark gray (10YR 3/1) rubbed; dry, the mixture of organically coated and uncoated sand grains has a salt-and-pepper appearance; weak fine granular structure; very friable; common fine and very fine roots; strongly acid; clear smooth boundary.

A—3 to 17 inches; dark gray (10YR 4/1) fine sand; single grained; loose; few fine and very fine roots; strongly acid; clear smooth boundary.

E1—17 to 35 inches; grayish brown (10YR 5/2) fine sand; few medium faint dark grayish brown (10YR 4/2) pockets and streaks; single grained; loose; few fine and very fine roots; strongly acid; gradual smooth boundary.

E2—35 to 54 inches; brown (10YR 4/3) fine sand; common fine and medium dark brown (10YR 3/3) pockets and streaks; single grained; loose; few fine and very fine roots; strongly acid; clear smooth boundary.

Btg1—54 to 62 inches; grayish brown (10YR 5/2) fine sandy loam; common fine and medium prominent yellowish red (5YR 4/6) mottles; massive; slightly sticky and slightly plastic; few fine and very fine roots; strongly acid; diffuse wavy boundary.

Btg2—62 to 80 inches; gray (10YR 5/1) sandy clay loam; common medium and coarse prominent light olive brown (2.5Y 5/4) and yellowish red (5YR 4/6) mottles; massive; sticky and slightly plastic; few fine and very fine roots; strongly acid.

The thickness of the solum and the depth to limestone bedrock range from 45 to more than 80 inches. Reaction ranges from strongly acid to neutral in the A and E horizons and from strongly acid to moderately alkaline in the Btg and underlying horizons.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It generally ranges from 2 to 7 inches in thickness. If value is 3 or less, the horizon is less than 7 inches thick.

The E horizon has hue of 10YR or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 3. It has mottles in shades of brown, yellow, or gray. It is sand or fine sand. The combined thickness of the A and E horizons ranges from 40 to 79 inches.

The Btg horizon has hue of 10YR to 5GY, value of 4 to 7, and chroma of 1 or 2. It has mottles in shades of brown, yellow, or red. It is fine sandy loam, sandy loam, or sandy clay loam. It is 5 to 24 inches thick.

Some pedons have a Cg horizon. This horizon has hue of 10YR to 2.5Y or is neutral in hue. It has value of 5 to 7 and chroma of 0 to 2. It is sand, fine sand, or loamy fine sand.

Some pedons have a 2R horizon at a depth of more than 45 inches. This horizon is commonly light gray or very pale brown limestone bedrock that has an irregular surface that can be dug with light power machinery.

Immokalee Series

The Immokalee series consists of deep or very deep, poorly drained soils that formed in sandy marine sediments. These soils are on flatwoods. Slope ranges from 0 to 2 percent. The soils are sandy, siliceous, hyperthermic, Arenic Haplaquods.

Immokalee soils are geographically associated with Adamsville, EauGallie, Holopaw, Janney, Myakka, Placid, Pomona, Pompano, Popash, Smyrna, and Zolfo soils. Adamsville and Zolfo soils are in the slightly higher landscape positions and are somewhat poorly drained. Adamsville, Holopaw, and Pompano soils do not have a spodic horizon. EauGallie, Holopaw, and Pomona soils have an argillic horizon at a depth of

more than 40 inches. Janney, Myakka, and Smyrna soils have a spodic horizon within a depth of 30 inches. Janney soils have limestone within a depth of 40 inches. Placid and Popash soils are in depressions, are very poorly drained, and have an umbric epipedon. Popash soils have an argillic horizon at a depth of more than 40 inches.

Typical pedon of Immokalee fine sand, in an area of Myakka, limestone substratum-Immokalee complex; approximately 900 feet east and 1,500 feet north of the southwest corner of sec. 27, T. 13 S., R. 14 E.

Ap—0 to 6 inches; fine sand, very dark gray (10YR 3/1) rubbed; dry, the mixture of organically coated and uncoated sand grains has a salt-and-pepper appearance; weak fine granular structure; very friable; common fine and very fine roots; moderately acid; abrupt smooth boundary.

E1—6 to 22 inches; gray (10YR 6/1) fine sand; single grained; loose; few fine and very fine roots; moderately acid; gradual wavy boundary.

E2—22 to 37 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine and very fine roots; moderately acid; abrupt wavy boundary.

Bh1—37 to 41 inches; black (10YR 2/1) fine sand; sand grains well coated with colloidal organic matter; weak fine granular structure; few fine and very fine roots; very strongly acid; clear wavy boundary.

Bh2—41 to 54 inches; dark brown (10YR 3/3) fine sand; single grained; loose; very strongly acid; clear wavy boundary.

BC—54 to 70 inches; dark brown (7.5YR 4/4) fine sand; single grained; loose; strongly acid; gradual wavy boundary.

C—70 to 80 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; moderately acid.

The thickness of the solum and the depth to limestone bedrock are more than 40 inches. Reaction generally ranges from extremely acid to moderately acid, but in some pedons it ranges from strongly acid to mildly alkaline.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It ranges from 2 to 10 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. In some pedons it has mottles in shades of yellow or brown. It is fine sand or sand. The combined thickness of the A and E horizons ranges from 30 to 50 inches.

The Bh horizon has hue of 5YR to 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 3. It is sand or fine sand that is coated with colloidal organic matter. It ranges from 10 to 28 inches in thickness.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4 or hue of 7.5YR, value of 4, and chroma of 2. It is sand or fine sand.

The C horizon, if it occurs, has hue of 10YR, value of 6 or 7, and chroma of 2 to 4. In some pedons it has mottles in shades of brown or yellow. It is sand or fine sand.

Some pedons have an E′ horizon below the Bh horizon. This horizon is underlain by a B′h horizon. The E′ horizon has colors and textures similar to those of the E horizon, and the B′h horizon has colors and textures similar to those of the Bh horizon.

Some pedons have a 2R horizon at a depth of more than 40 inches. This horizon is generally white or very pale brown limestone bedrock that can be dug with light power machinery. Some pedons have a discontinuous layer of loamy residual soil material directly above the 2R horizon. This layer is less than 3 inches thick. In many pedons the content of cobble- or stone-sized fragments that overlie the 2R horizon is as much as 2 percent.

Janney Series

The Janney series consists of moderately deep, poorly drained soils that formed in sandy marine sediments underlain by limestone. These soils are on flatwoods. Slope ranges from 0 to 2 percent. The soils are sandy, siliceous, hyperthermic, Entic Haplaquods.

Janney soils are geographically associated with Boca, EauGallie, Hallandale, Holopaw, Immokalee, Myakka, Pineda, Placid, Popash, and Smyrna soils. Boca, Pineda, Hallandale, and Holopaw soils do not have a spodic horizon. Boca, EauGallie, Pineda, and Holopaw soils have an argillic horizon. EauGallie, Holopaw, Immokalee, Myakka, Pineda, and Smyrna soils do not have limestone within a depth of 40 inches. Hallandale soils have limestone within a depth of 20 inches. Immokalee soils do not have a spodic horizon within a depth of 40 inches. Placid and Popash soils are in depressions, have an umbric epipedon, and are very poorly drained.

Typical pedon of Janney fine sand, in an area of Immokalee, limestone substratum-Janney complex; approximately 1,500 feet north and 1,100 feet east of the southwest corner of sec. 19, T. 13 S., R. 14 E.

A—0 to 8 inches; very dark gray (10YR 3/1) fine sand; many gray and light gray uncoated sand grains; weak fine granular structure; very friable; common fine and medium roots; slightly acid; abrupt wavy boundary.

E1—8 to 14 inches; gray (10YR 5/1) fine sand; single grained; loose; common fine and medium roots; moderately acid; clear wavy boundary.

E2—14 to 20 inches; light gray (10YR 6/1) fine sand; few fine prominent very dark brown (10YR 2/2) streaks and pockets; single grained; loose; few fine roots; moderately acid; abrupt wavy boundary.

Bh1—20 to 24 inches; very dark brown (10YR 2/2) fine sand; sand grains well coated with colloidal organic matter; weak fine subangular blocky structure; friable; few fine roots; neutral; clear wavy boundary.

Bh2—24 to 27 inches; very dark grayish brown (10YR 3/2) fine sand; sand grains coated with colloidal organic matter; weak fine subangular blocky structure; very friable; few fine roots; neutral; abrupt irregular boundary.

2R—27 inches; limestone bedrock that can be dug with light power machinery.

The thickness of the solum and the depth to limestone bedrock range from 20 to 40 inches. Reaction ranges from extremely acid to slightly acid in the A and E horizons and from very strongly acid to neutral in the Bh horizon.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. It ranges from 3 to 9 inches in thickness.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 1. The combined thickness of the A and E horizons ranges from 7 to 29 inches. The E horizon is more than 4 inches thick.

The Bh horizon has hue of 10YR, value of 2, and chroma of 1 or 2; value of 3 and chroma of 1 to 3; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 3, and chroma of 2 to 4. It is sand, fine sand, or loamy fine sand. It ranges from 2 to 10 inches in thickness.

The 2R horizon is limestone bedrock. The degree of hardness is variable. The bedrock can generally be dug with power machinery. Many pedons have solution holes in the bedrock that are filled with loamy material.

Jonesville Series

The Jonesville series consists of moderately deep, well drained soils that formed in sandy and loamy marine sediments underlain by limestone. These soils are on karst uplands. Slope ranges from 0 to 5 percent. The soils are loamy, siliceous, hyperthermic, Arenic Hapludalfs.

Jonesville soils are geographically associated with Bushnell, Levyville, Lutterloh, Mabel, Moriah, Otela, Pedro, Seaboard, Shadeville, and Tavares soils. Bushnell and Mabel soils are somewhat poorly drained and have a clayey argillic horizon that is within a depth of 20 inches. Mabel, Moriah, and Shadeville soils do not have limestone within a depth of 40 inches. Lutterloh and Moriah soils are somewhat poorly drained. Lutterloh and Otela soils have a sandy epipedon that is 40 to 79 inches thick. Levyville and Pedro soils have a loamy argillic horizon within a depth of 20 inches. Levyville soils do not have limestone within a depth of 60 inches. Pedro and Seaboard soils have limestone within a depth of 20 inches. Seaboard soils do not have an argillic horizon. Tavares soils are sandy to a depth of more than 80 inches.

Typical pedon of Jonesville fine sand, in an area of Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes; approximately 2,600 feet north and 1,250 feet east of the southwest corner of sec. 21, T. 11 S., R. 14 E.

Ap—0 to 5 inches; gray (10YR 5/1) fine sand; single grained; loose; common fine and very fine and common medium roots; slightly acid; clear wavy boundary.

E1—5 to 14 inches; pale brown (10YR 6/3) fine sand; many fine and medium faint light brownish gray (10YR 6/2) and light gray (10YR 7/1) pockets and streaks of uncoated sand grains; single grained; loose; few fine and medium and few coarse roots; slightly acid; gradual wavy boundary.

E2—14 to 27 inches; very pale brown (10YR 7/3) fine sand; many fine and medium distinct light gray (10YR 7/1) sand strippings; common fine and medium distinct yellow (10YR 7/6) stains; single grained; loose; few fine and medium and few coarse roots; slightly acid; abrupt irregular boundary.

Bt—27 to 35 inches; brownish yellow (10YR 6/6) sandy clay loam; common fine distinct yellowish brown (7.5YR 5/8) and light yellowish brown (10YR 6/4) mottles; weak fine subangular blocky structure; friable; few fine and very fine roots; mildly alkaline; abrupt irregular boundary.

2R—35 inches; white (10YR 8/1) and very pale brown (10YR 8/4) limestone bedrock that has common or many solution holes and that can be dug with light power machinery.

The thickness of the solum and the depth to limestone bedrock range from 24 to 40 inches. Many pedons have common or many solution holes that extend to a depth of more than 60 inches. Reaction ranges from strongly acid to slightly acid in the A and E horizons and from neutral to moderately alkaline in the Bt horizon. In many areas limestone or chert stones and boulders are on the surface or within the solum.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 4 to 9 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 2 to 6. In some pedons it has white or light gray sand strippings and mottles in shades of brown or

yellow. The combined thickness of the A and E horizons ranges from 20 to 35 inches.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8 or value of 4 and chroma of 4 to 6. In some pedons it has mottles in shades of brown, yellow, or gray. Gray mottles are derived from the parent material and are not indicative of wetness. This horizon is fine sandy loam or sandy clay loam. The average content of clay ranges from 15 to 35 percent. Some pedons have as much as 15 percent gravel-sized limestone fragments in the lower parts of the Bt horizon. The Bt horizon ranges from 3 to 19 inches in thickness.

Some pedons have a 2Cr horizon directly above the layer of more consolidated bedrock. This horizon is white or very pale brown, soft limestone that can be dug with a spade. It commonly has few to many cobble- to boulder-sized, hard limestone fragments. It is less than 16 inches thick.

The 2R horizon is white or very pale brown limestone bedrock that can be excavated only with power equipment. Most pedons have solution holes in the bedrock that are filled with soil material similar to that of the 2Cr or Bt horizon.

Levyville Series

The Levyville series consists of very deep, well drained soils that formed in loamy sediments. These soils are on karst uplands. Slope ranges from 0 to 5 percent. The soils are fine-loamy, siliceous, hyperthermic Ultic Hapludalfs.

Levyville soils are geographically associated with Bonneau, Bushnell, Jonesville, Mabel, Moriah, Otela, Pedro, Pender, and Shadeville soils. Bushnell, Mabel, Pender, and Moriah soils are somewhat poorly drained. Bushnell soils have limestone within a depth of 40 inches. Bonneau, Moriah, and Shadeville soils have a sandy epipedon that is 20 to 40 inches thick. Jonesville soils have limestone within a depth of 40 inches and have a sandy epipedon that is more than 20 inches thick. Otela soils have a sandy epipedon that is more than 40 inches thick. Pedro soils have limestone within a depth of 20 inches.

Typical pedon of Levyville loamy fine sand, in an area of Levyville-Shadeville complex, 2 to 5 percent slopes; approximately 1,700 feet west and 2,050 feet north of the southeast corner of sec. 1, T. 13 S., R. 18 E.

Ap—0 to 8 inches; dark brown (10YR 3/3) loamy fine sand, brown (10YR 5/3) dry; few fine prominent strong brown (7.5YR 5/6) pockets; weak fine granular structure; very friable; common fine and medium roots; moderately acid; abrupt smooth boundary.

Bt1—8 to 29 inches; brown (7.5YR 4/4) sandy clay loam; weak medium subangular blocky structure; friable; few fine and very fine roots; few gravel-sized limestone fragments; strongly acid; diffuse wavy boundary.

Bt2—29 to 54 inches; brown (7.5YR 4/4) sandy clay loam; weak medium subangular blocky structure; friable; few fine and very fine roots; few manganese concretions 1 or 2 millimeters in diameter; few gravel-sized limestone fragments; very strongly acid; diffuse wavy boundary.

Bt3—54 to 80 inches; dark yellowish brown (10YR 4/4) sandy clay loam; common fine and medium prominent strong brown (7.5YR 4/6 and 5/6) and few medium distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; few fine and very fine roots; common dark manganese concretions 1 or 2 millimeters in diameter; few gravel-sized limestone fragments; very strongly acid.

The thickness of the solum and the depth to bedrock range from 60 to more than 80 inches. Reaction ranges from very strongly acid to moderately acid throughout the profile. In some pedons the content of gravel- to stone-sized limestone fragments on the surface or buried within the solum is as much as 2 percent.

The A horizon has hue of 10YR. It has value of 3 and chroma of 1 to 3 or value of 4 and chroma of 1 or 2. It is fine sand or loamy fine sand. It ranges from 4 to 9 inches in thickness.

Some pedons have an EB horizon. This horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. In some pedons it has mottles in shades of brown or yellow. It is fine sand or loamy fine sand. The combined thickness of the A and EB horizons is less than 20 inches.

The Bt horizon has hue of 10YR or 7.5YR. It has value of 4 and chroma of 3 or 4 or value of 5 and chroma of 3 to 8. In some pedons it has mottles in shades of yellow or brown. Some pedons have mottles in shades of gray at a depth of more than 4 feet. The Bt horizon is fine sandy loam or sandy clay loam. The average content of clay ranges from 18 to 34 percent in the upper 20 inches of the argillic horizon. In pedons that have matrix chroma of 5 or more in the argillic horizon, the percentage of clay decreases by at least 20 percent of the maximum within a depth of 60 inches. The Bt horizon ranges from 21 to 76 inches in thickness.

In some pedons a Btg horizon is at a depth of more than 60 inches. This horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. It has mottles in shades of yellow and brown. It is sandy clay loam.

In many pedons a BC horizon is at a depth of more than 40 inches. It has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It has mottles in shades of brown or yellow. It is loamy sand. It is less than 20 inches thick.

In many pedons a C horizon is at a depth of more than 60 inches. It has hue of 10YR, value of 7 or 8, and chroma of 1 to 3. It has mottles and streaks in shades of brown or yellow. It is sand or fine sand.

Lochloosa Series

The Lochloosa series consists of very deep, somewhat poorly drained soils that formed in sandy and loamy marine sediments. These soils are on sandy uplands north of Priest Prairie, along the western edge of Lake Stafford, and along the eastern edge of the Chiefland Limestone Plain. Slope ranges from 1 to 5 percent. The soils are loamy, siliceous, hyperthermic Aquic Arenic Paleudults.

Lochloosa soils are geographically associated with Adamsville, Bonneau, Ft. Green, Hicoria, Holopaw, Millhopper, Sparr, and Tavares soils. Adamsville soils are sandy to a depth of more than 80 inches. Ft. Green, Hicoria, and Holopaw soils are poorly drained. Hicoria and Holopaw soils are in the lower landscape positions. Hicoria soils have an umbric epipedon. Holopaw, Millhopper, and Sparr soils do not have an argillic horizon within a depth of 40 inches. Bonneau, Millhopper, and Tavares soils are in the slightly higher landscape positions and are better drained than the Lochloosa soils. Tavares soils are sandy to a depth of more than 80 inches.

Typical pedon of Lochloosa fine sand, in an area of Sparr-Lochloosa complex, 1 to 5 percent slopes; approximately 1,400 feet north and 100 feet west of the southeast corner of sec. 34, T. 13 S., R. 18 E.

Ap1—0 to 3 inches; fine sand, dark grayish brown (10YR 4/2) rubbed; dry, the mixture of organically coated and uncoated sand grains has a salt-and-pepper appearance; weak fine granular structure; very friable; common fine and very fine roots; very strongly acid; clear smooth boundary.

Ap2—3 to 8 inches; gray (10YR 5/1) fine sand; single grained; loose; few fine and very fine roots; very strongly acid; clear smooth boundary.

E2—8 to 14 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; few fine and very fine roots; very strongly acid; gradual smooth boundary.

E3—14 to 25 inches; grayish brown (10YR 5/2) fine sand; few fine faint light gray (10YR 6/1) mottles; single grained; loose; few fine and very fine roots; very strongly acid; clear smooth boundary.

E4—25 to 34 inches; dark brown (7.5YR 4/4) fine sand; few fine distinct light gray (10YR 6/2) mottles; single grained; loose; few fine and very fine roots; very strongly acid; diffuse wavy boundary.

E5—34 to 38 inches; brown (10YR 5/3) fine sand; few fine faint grayish brown (10YR 5/2) mottles; single grained; loose; few fine and very fine roots; very strongly acid; abrupt wavy boundary.

Btg1—38 to 56 inches; light brownish gray (10YR 6/2) fine sandy loam; many medium and coarse prominent strong brown (7.5YR 5/8 and 4/6) mottles; weak medium subangular blocky structure; very friable, slightly sticky and slightly plastic; few fine and very fine roots; very strongly acid; diffuse wavy boundary.

Btg2—56 to 66 inches; light brownish gray (10YR 6/2) fine sandy loam; common fine and medium prominent strong brown (7.5YR 5/8 and 4/6) mottles; weak medium subangular blocky structure; very friable, slightly sticky and slightly plastic; few fine and very fine roots; very strongly acid; diffuse wavy boundary.

BCg—66 to 80 inches; fine sandy loam, light gray (10YR 7/1 and 7/2) mixed; few fine prominent strong brown (7.5YR 5/8 and 4/6) mottles; few fine distinct brown (10YR 5/3) stains around roots; weak medium subangular blocky structure; very friable, slightly sticky and slightly plastic; few fine and very fine roots; very strongly acid.

The solum is more than 60 inches thick. Reaction is very strongly acid or strongly acid throughout. In some pedons gravel- to stone-sized chert fragments are on the surface or buried within the solum. The content of these fragments is generally less than 5 percent by volume.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 5 to 8 inches in thickness.

The E horizon has hue of 10YR or 7.5YR, value of 4 to 7, and chroma of 2 to 4. It has mottles in shades of brown, yellow, or gray. The combined thickness of the A and E horizons is 20 to 39 inches.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It has mottles in shades of brown, yellow, or red. It is fine sandy loam or sandy clay loam. The depth to the Btg horizon is less than 40 inches. In many pedons, a Bt horizon overlies the Btg horizon. It has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It has mottles in shades of gray, brown, or yellow. The Bt horizon has textures similar to those of the Btg horizon. The combined thickness of the Bt and Btg horizons is more than 40 inches.

Some pedons have a BCg horizon that has hue of 10YR, value of 7, and chroma of 1 or 2. In some

pedons this horizon has mottles in shades of yellow or brown. It is fine sandy loam or sandy clay loam. In some pedons it has few fine pockets and lenses of loamy fine sand.

Lutterloh Series

The Lutterloh series consists of very deep, somewhat poorly drained soils that formed in sandy and loamy marine sediments underlain by limestone. These soils are on karst uplands or along the Withlacoochee River. Slope ranges from 0 to 5 percent. The soils are loamy, siliceous, thermic Grossarenic Paleudalfs.

Lutterloh soils are geographically associated with Adamsville, Broward, Bushnell, Jonesville, Mabel, Moriah, Otela, Shadeville, and Tavares soils. Adamsville and Tavares soils are sandy to a depth of more than 80 inches. Bushnell and Mabel soils have a clayey argillic horizon within a depth of 20 inches. Broward soils are sandy throughout and have bedrock at a depth of 20 to 40 inches. Shadeville and Jonesville soils are better drained than the Lutterloh soils and have an argillic horizon within a depth of 40 inches. Jonesville soils have limestone within a depth of 40 inches. Moriah soils have an argillic horizon at a depth of 20 to 40 inches. Otela soils are moderately well drained.

Typical pedon of Lutterloh fine sand, in an area of Lutterloh-Moriah complex, 0 to 5 percent slopes; approximately 1,700 feet east and 2,700 feet south of the northwest corner of sec. 25, T. 13 S., R. 18 E.

Ap—0 to 7 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

E1—7 to 23 inches; light brownish gray (10YR 6/2) fine sand; common medium faint brown (10YR 5/3), light gray (10YR 7/2), and dark gray (10YR 4/1) pockets and streaks; single grained; loose; common fine and medium roots; very strongly acid; clear wavy boundary.

E2—23 to 42 inches; light gray (10YR 7/2) fine sand; common fine faint brown (10YR 5/3) and distinct yellowish brown (10YR 5/6) mottles and streaks; single grained; loose; few fine and very fine roots; strongly acid; diffuse wavy boundary.

E3—42 to 57 inches; white (10YR 8/1) fine sand; few fine distinct brown (10YR 5/3) and pale brown (10YR 6/3) mottles; single grained; loose; few fine roots; moderately acid; abrupt wavy boundary.

Btg1—57 to 69 inches; light gray (10YR 6/1) sandy clay loam; many medium and coarse prominent strong brown (7.5YR 4/6) mottles; common fine prominent red (2.5YR 4/6) streaks; weak medium subangular blocky structure; slightly sticky and plastic; very strongly acid; diffuse wavy boundary.

Btg2—69 to 80 inches; light gray (10YR 6/1) sandy clay; few fine and medium prominent dark yellowish brown (10YR 4/6) and common fine and medium prominent strong brown (7.5YR 5/6) mottles; strong medium subangular blocky structure; sticky and plastic; very strongly acid.

The thickness of the solum and the depth to limestone are more than 60 inches. Reaction ranges from very strongly acid to moderately acid in the A and E horizons and from very strongly acid to neutral in the Btg horizon. The average content of clay ranges from 15 to 35 percent in the upper 20 inches of the argillic horizon. In some pedons the content of gravel- to boulder-sized limestone or chert fragments on the surface or within the solum is as much as 3 percent. The depth to the Btg horizon ranges from 40 to 78 inches.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 5 to 9 inches in thickness. In some pedons a thin AE horizon underlies the A horizon. The AE horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 1 to 3. In some pedons it has white or light gray sand strippings or mottles in shades of brown or yellow. In some pedons an EB horizon underlies the E horizon. The EB horizon has hue of 10YR, value of 4 or 5, and chroma of 3. In some pedons a thin, discontinuous, organically stained Bh horizon overlies the Btg horizon. The Bh horizon has hue of 10YR, value of 3, and chroma of 2 or 3. It generally is less than 2 inches thick. The texture of the E, EB, and Bh horizons is fine sand or sand.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of brown, yellow, or red. It is fine sandy loam or sandy clay loam in the upper part and sandy clay loam or sandy clay in the lower part. It ranges from 8 to more than 40 inches in thickness.

Some pedons have a 2R horizon at a depth of more than 60 inches. This horizon is white or very pale brown limestone bedrock that has an irregular surface. It can be dug with light power machinery.

Mabel Series

The Mabel series consists of deep or very deep, somewhat poorly drained soils that formed in sandy to clayey marine sediments underlain by limestone. These soils are on karst uplands. Slope ranges from 0 to 5 percent. The soils are fine, mixed, hyperthermic Albaquic Hapludalfs.

Mabel soils are geographically associated with Bushnell, Ft. Green, Jonesville, Levyville, Lutterloh, Moriah, Otela, Pedro, and Shadeville soils. Ft. Green soils are poorly drained and do not have limestone within a depth of 80 inches. Ft. Green, Jonesville, Moriah, and Shadeville soils have a sandy epipedon that is 20 to 40 inches thick. Bushnell soils have limestone at a depth of 20 to 40 inches. Jonesville, Levyville, Pedro, and Shadeville soils are better drained than the Mabel soils. Jonesville soils have bedrock within a depth of 40 inches. Lutterloh and Otela soils have a sandy epipedon that is 40 to 80 inches thick. Otela soils are moderately well drained. Pedro soils have limestone within a depth of 20 inches.

Typical pedon of Mabel fine sand, in an area of Moriah-Bushnell-Mabel, limestone substratum, complex, 0 to 5 percent slopes; approximately 1,000 feet east and 1,200 feet north of the southwest corner of sec. 21, T. 13 S., R. 19 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sand; common gravel-sized chert fragments; weak fine granular structure; very friable; many fine, medium, and coarse roots; very strongly acid; gradual wavy boundary.

E—7 to 14 inches; yellowish brown (10YR 5/4) fine sand; common medium distinct dark gray (10YR 4/1) pockets and streaks; common gravel- and cobble-sized chert fragments; weak fine granular structure; very friable; few fine and medium roots; very strongly acid; abrupt smooth boundary.

Bt1—14 to 18 inches; brown (10YR 5/3) sandy clay loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; common gravel- and cobble-sized chert fragments; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; very strongly acid; gradual wavy boundary.

Bt2—18 to 31 inches; yellowish brown (10YR 5/4) clay; many fine and medium distinct grayish brown (10YR 5/2) mottles; few prominent strong brown (7.5YR 4/6) stains and coatings around chert fragments; moderate medium subangular blocky structure; sticky and plastic; few fine and medium roots; very strongly acid; diffuse wavy boundary.

Btg1—31 to 41 inches; light gray (10YR 6/1) clay; many medium and coarse prominent yellowish brown (10YR 5/6) and few medium prominent dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; sticky and plastic; few fine and medium roots; very strongly acid; diffuse wavy boundary.

Btg2—41 to 53 inches; light gray (10YR 6/1) clay; many medium and coarse distinct pale brown (10YR 6/3) mottles; strong medium subangular blocky structure; sticky and plastic; few fine and medium roots; very strongly acid; abrupt wavy boundary.

2R—53 inches; light gray (10YR 7/1 and 7/2) limestone bedrock that can be dug with light power machinery.

The solum ranges from 40 to 60 inches in thickness. The depth to limestone dominantly ranges from 40 to 72 inches, but many pedons have solution holes that extend to a depth of more than 80 inches. An abrupt textural change occurs within a depth of 20 inches. The average content of clay ranges from 35 to 59 percent in the upper 20 inches of the argillic horizon. Reaction ranges from very strongly acid to neutral in the A, E, and Bt horizons and from very strongly acid to moderately alkaline in the Btg horizon. In some pedons gravel- to boulder-sized limestone or chert fragments are on the surface or within the solum.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. It generally is less than 8 inches thick. If value is 3 and the A horizon directly overlies the Bt horizon, the A horizon ranges from 3 to 6 inches in thickness and the boundary is abrupt.

Many pedons have an E horizon. The E horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. In some pedons it has mottles in shades of brown or yellow or pockets and streaks of material that has colors similar to those of the A horizon. The E horizon is fine sand or loamy fine sand. It is less than 16 inches thick. The combined thickness of the A and E horizons is less than 20 inches.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. In some pedons it has mottles in shades of red, yellow, or brown. It has mottles in shades of gray within the upper 10 inches. It is dominantly sandy clay or clay, but in some pedons the range includes sandy clay loam in the upper 10 inches. This horizon ranges from 5 to 35 inches in thickness.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It has mottles in shades of red, yellow, or brown. The upper boundary of the Btg horizon is at a depth of 20 to 39 inches. The texture is sandy clay or clay. The combined thickness of the Bt and Btg horizons is 21 to 50 inches.

The 2R horizon is white or pale brown limestone bedrock that can be excavated with power equipment.

Matmon Series

The Matmon series consists of shallow, somewhat poorly drained soils that formed in sandy and loamy marine sediments underlain by limestone. These soils are on low ridges. Slope ranges from 0 to 2 percent. The soils are loamy, siliceous, thermic, shallow Aquic Hapludalfs.

Matmon soils are geographically associated with Aripeka, Boca, Chobee, Waccasassa, and Wekiva soils. Aripeka soils have limestone at a depth of more than 20 inches. Chobee soils are very poorly drained, frequently flooded, and in the lower landscape positions. Boca soils have a sandy epipedon that is more than 20 inches thick. Waccasassa and Wekiva soils are poorly drained.

Typical pedon of Matmon fine sand, in an area of Aripeka-Matmon complex; approximately 3,900 feet south and 900 feet east of the northwest corner of sec. 21, T. 14 S., R. 16 E.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) fine sand; weak fine granular structure; very friable; many fine and few medium roots; many uncoated sand grains; strongly acid; clear wavy boundary.

E—3 to 6 inches; brown (10YR 5/3) fine sand; single grained; loose; common fine and medium roots; moderately acid; clear wavy boundary.

Bt—6 to 15 inches; strong brown (7.5YR 4/6) sandy clay loam; common faint brown (7.5YR 5/4) coatings on faces of peds; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and very fine roots; mildly alkaline; clear wavy boundary.

2Cr—15 to 24 inches; white (10YR 8/2) and light yellowish brown (10YR 6/4) limestone that can be dug with difficulty using a pick and shovel.

2R—24 inches; limestone bedrock that can be dug with light power machinery.

The thickness of the solum and the depth to limestone bedrock range from 10 to 20 inches. Reaction ranges from strongly acid to neutral in the A and E horizons and from slightly acid to mildly alkaline in the Bt horizon. In some pedons the content of gravel- to boulder-sized limestone fragments on the surface or within the solum is as much as 5 percent.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It ranges from 3 to 6 inches in thickness.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. It is fine sand or loamy fine sand.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. In some pedons the lower part of the Bt horizon has mottles in shades of gray that extend into solution holes in the limestone. This horizon is fine sandy loam or sandy clay loam. The average content of clay ranges from 12 to 35 percent. The Bt horizon ranges from 6 to 12 inches in thickness.

The 2Cr horizon, if it occurs, is white, pale brown, or light yellowish brown, soft limestone that can be dug with difficulty or is powdery, carbonatic material that has few to many limestone fragments.

The 2R horizon is limestone that can be dug with light power machinery. In many areas fissures and small cavities filled with water are within the bedrock.

Micanopy Series

The Micanopy series consists of very deep, somewhat poorly drained soils that formed in sandy to clayey marine sediments. These soils are on uplands. Slope ranges from 1 to 5 percent. The soils are fine, mixed, hyperthermic Aquic Paleudalfs.

Micanopy soils are geographically associated with Adamsville, Bivans, Bushnell, Ft. Green, Hicoria, Holopaw, Lochloosa, Mabel, Sparr, and Tavares soils. Adamsville and Tavares soils are sandy to a depth of more than 80 inches. Bushnell and Mabel soils have limestone bedrock within a depth of 72 inches. Bivans and Ft. Green soils have a seasonal high water table within a depth of 18 inches. Ft. Green, Hicoria, and Holopaw soils have a sandy epipedon that is more than 20 inches thick. Hicoria and Holopaw soils are in the lower landscape positions and are poorly drained or very poorly drained. Hicoria soils have an umbric epipedon. Lochloosa soils have a sandy epipedon that is 20 to 40 inches thick, and Sparr soils have a sandy epipedon that is 40 to 80 inches thick. Tavares soils are in the slightly higher landscape positions and are better drained than the Micanopy soils.

Typical pedon of Micanopy loamy fine sand, 1 to 5 percent slopes, approximately 2,600 feet west and 2,500 feet south of the northeast corner of sec. 9, T. 13 S., R. 17 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) loamy fine sand; weak fine granular structure; very friable; common fine and very fine roots; moderately acid; abrupt smooth boundary.

Bt1—7 to 15 inches; yellowish brown (10YR 5/4) sandy clay; weak medium subangular blocky structure; very friable; few fine and very fine roots; strongly acid; gradual wavy boundary.

Bt2—15 to 21 inches; brown (10YR 5/3) sandy clay; few fine faint yellowish brown (10YR 5/4), dark yellowish brown (10YR 4/4), and grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; few fine and very fine roots; strongly acid; gradual wavy boundary.

Btg1—21 to 28 inches; grayish brown (10YR 5/2) sandy clay; many medium and coarse faint brown (10YR 5/3) and common fine and medium distinct dark yellowish brown (10YR 4/6) mottles; weak medium subangular blocky structure; friable; few fine and very fine roots; strongly acid; gradual wavy boundary.

Btg2—28 to 37 inches; grayish brown (10YR 5/2) sandy

clay; many medium and coarse faint brown (10YR 5/3) and many medium and coarse distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine and very fine roots; very strongly acid; gradual wavy boundary.

Btg3—37 to 56 inches; gray (10YR 5/1) sandy clay; many fine and medium distinct dark brown (10YR 4/3) and dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; friable; few fine and very fine roots; very strongly acid; gradual wavy boundary.

BCg1—56 to 68 inches; grayish brown (10YR 5/2) and light gray (10YR 7/2) sandy clay loam; many fine and medium distinct dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; friable; few fine and very fine roots; strongly acid; gradual wavy boundary.

BCg2—68 to 80 inches; gray (10YR 5/1) clay; common medium and coarse prominent dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable, sticky and plastic; few fine and very fine roots; moderately acid.

The solum is more than 80 inches thick. Reaction ranges from extremely acid to moderately acid throughout the profile. In some pedons the content of gravel-sized limestone or chert fragments throughout the profile is as much as 5 percent. In some pedons the content of stone- or boulder-sized limestone or chert fragments on the surface or within the solum is as much as 2 percent.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It ranges from 4 to 8 inches in thickness.

Many pedons have an E horizon underlying the A horizon. This horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. In some pedons it has mottles in shades of gray or brown. It is fine sand or loamy fine sand. The combined thickness of the A and E horizons is less than 20 inches.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. In some pedons it has mottles in shades of brown or yellow. It has mottles in shades of gray within a depth of 30 inches. The Bt horizon is sandy clay loam or sandy clay. It ranges from 8 to 16 inches in thickness. Some pedons have a BE horizon that is fine sandy loam. This horizon is less than 4 inches thick. The combined thickness of the A, E, BE, and Bt horizons ranges from 20 to 36 inches.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It has mottles in shades of gray, brown, yellow, or red. It is sandy clay or clay. It ranges from 30 to 42 inches in thickness.

The BCg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of yellow, brown, or red. It is sandy clay loam, sandy clay, or clay.

Millhopper Series

The Millhopper series consists of very deep, moderately well drained soils that formed in sandy and loamy marine sediments. These soils are on uplands. Slope ranges from 1 to 5 percent. The soils are loamy, siliceous, hyperthermic, Grossarenic Paleudults.

Millhopper soils are geographically associated with Adamsville, Apopka, Astatula, Candler, Bonneau, Orlando, Placid, Popash, Sparr, and Tavares soils. Adamsville, Astatula, Candler, Orlando, and Tavares soils do not have an argillic horizon. Adamsville and Sparr soils are in the slightly lower landscape positions and are somewhat poorly drained. Astatula, Candler, and Orlando soils are better drained than the Millhopper soils and are generally in the slightly higher landscape positions. Apopka soils are well drained. Bonneau soils have a loamy argillic horizon within a depth of 40 inches. Placid and Popash soils are in depressions and are very poorly drained.

Typical pedon of Millhopper fine sand, 1 to 5 percent slopes, approximately 1,600 feet east and 1,250 feet south of the northwest corner of sec. 27, T. 13 S., R. 17 E.

Ap1—0 to 4 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; common fine and medium and few coarse roots; very strongly acid; abrupt smooth boundary.

Ap2—4 to 8 inches; very dark gray (10YR 3/1) fine sand, gray (10YR 5/1) dry; weak fine granular structure; very friable; common fine and medium and few coarse roots; very strongly acid; abrupt wavy boundary.

E1—8 to 18 inches; pale brown (10YR 6/3) fine sand; few fine and medium distinct black (10YR 2/1) pockets surrounding small fragments of charcoal; single grained; loose; few fine and medium and few coarse roots; strongly acid; gradual wavy boundary.

E2—18 to 41 inches; very pale brown (10YR 7/4) fine sand; common medium distinct grayish brown (10YR 5/2) krotovinas; single grained; loose; few fine and medium and few coarse roots; strongly acid; gradual wavy boundary.

E3—41 to 55 inches; very pale brown (10YR 8/4) fine sand; many fine and medium faint very pale brown (10YR 8/3) and many fine and medium distinct brownish yellow (10YR 6/6) and light brownish gray

(10YR 6/2) mottles; single grained; loose; few fine and medium roots; strongly acid; clear wavy boundary.

EB—55 to 63 inches; brownish yellow (10YR 6/8) fine sand; many fine and medium distinct brownish yellow (10YR 6/6) mottles; single grained; loose; few fine and medium roots; strongly acid; clear wavy boundary.

Bt—63 to 80 inches; yellowish brown (10YR 5/6) sandy clay loam; many medium prominent light gray (10YR 7/2) mottles; weak fine subangular blocky structure; friable; very strongly acid.

The solum is more than 80 inches thick. Reaction ranges from very strongly acid to slightly acid in the A and E horizons and is very strongly acid or strongly acid in the Bt horizon. In some pedons the content of cobble- or stone-sized chert fragments on the surface or buried within the solum is as much as 2 percent.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. It ranges from 3 to 9 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 8 in the upper part and value of 6 to 8 and chroma of 2 to 4 in the lower part. In some pedons it has mottles in shades of brown, yellow, or gray. It has mottles in shades of gray below a depth of 40 inches. The combined thickness of the A and E horizons ranges from 40 to 78 inches.

Some pedons have an EB horizon that overlies the Bt horizon. The EB horizon has hue of 10YR, value of 6, and chroma of 6 to 8. It is fine sand or loamy fine sand. It is less than 8 inches thick.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 3 to 6. In some pedons it has mottles in shades of brown, yellow, red, or gray. It is fine sandy loam or sandy clay loam. It ranges from 5 to 20 inches in thickness.

Many pedons have a Btg horizon. This horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. It has mottles in shades of brown, yellow, or gray. It is fine sandy loam or sandy clay loam. It is less than 20 inches thick. Pedons that do not have a Btg horizon have mottles in shades of gray in the Bt horizon.

Moriah Series

The Moriah series consists of deep or very deep, somewhat poorly drained soils that formed in sandy and clayey marine sediments underlain by limestone. These soils are on karst uplands. Slope ranges from 0 to 5 percent. The soils are loamy, siliceous, thermic Aquic Arenic Hapludalfs.

Moriah soils are geographically associated with Bushnell, Jonesville, Lutterloh, Mabel, Otela, Pedro, Shadeville, and Tavares soils. Bushnell, Mabel, and Pedro soils have an argillic horizon within a depth of 20 inches. Bushnell and Jonesville soils have limestone bedrock within a depth of 40 inches. Pedro soils are well drained and have limestone within a depth of 20 inches. Shadeville and Jonesville soils are better drained than the Moriah soils. Lutterloh and Otela soils have a sandy epipedon that is 40 to 80 inches thick. Otela and Tavares soils are moderately well drained. Tavares soils are sandy to a depth of more than 80 inches.

Typical pedon of Moriah fine sand, in an area of Moriah-Bushnell-Mabel, limestone substratum, complex, 0 to 5 percent slopes; approximately 1,100 feet west and 100 feet south of the northeast corner of sec. 18, T. 13 S., R. 19 E.

Ap—0 to 9 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; few coarse charcoal fragments; many fine and very fine roots; strongly acid; clear wavy boundary.

E1—9 to 16 inches; very pale brown (10YR 7/3) fine sand; many medium and coarse distinct dark gray (10YR 4/1) pockets; few fine prominent brownish yellow (10YR 6/8) mottles; single grained; loose; few fine and very fine roots; strongly acid; gradual wavy boundary.

E2—16 to 28 inches; white (10YR 8/2) fine sand; few coarse distinct dark gray (10YR 4/1) pockets and krotovinas; few fine prominent brownish yellow (10YR 6/8) mottles; single grained; loose; few fine and very fine roots; very strongly acid; abrupt wavy boundary.

Bt—28 to 32 inches; light yellowish brown (10YR 6/4) fine sandy loam; common fine faint pale brown (10YR 6/3) and few fine prominent strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; very friable, slightly sticky and slightly plastic; few fine and very fine roots; strongly acid; clear smooth boundary.

Btg1—32 to 44 inches; light gray (10YR 7/2) sandy clay loam; many fine and medium prominent yellowish red (5YR 5/8) and distinct light yellowish brown (10YR 6/4) mottles; weak fine subangular blocky structure; friable, slightly sticky and plastic; few fine and very fine roots; strongly acid; diffuse wavy boundary.

Btg2—44 to 52 inches; light gray (10YR 7/1) fine sandy loam; common fine and medium prominent reddish yellow (5YR 6/6) and yellow (10YR 7/6) mottles; weak fine subangular blocky structure; friable, slightly sticky and plastic; few fine and very fine roots; strongly acid; diffuse wavy boundary.

Btg3—52 to 68 inches; light gray (10YR 7/1) clay;

common medium prominent reddish yellow (5YR 6/6) and yellow (10YR 7/6) mottles; strong medium subangular blocky structure; firm, sticky and plastic; neutral; abrupt irregular boundary.

2R—68 inches; white (10YR 8/2) and very pale brown (10YR 8/3) limestone bedrock that can be dug with light power machinery.

The thickness of the solum and the depth to limestone bedrock generally range from 40 to 72 inches, but in many pedons the bedrock has solution holes that extend to a depth of more than 80 inches. Reaction ranges from extremely acid to strongly acid in the A and E horizons and from very strongly acid to neutral in the Bt and Btg horizons. The average content of clay is less than 35 percent in the upper 20 inches of the argillic horizon. In many pedons the content of gravel- to boulder-sized limestone or chert fragments on the surface or within the solum is as much as 5 percent.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. It ranges from 6 to 9 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 2 or 3. In some pedons, it has sand strippings or it has mottles in shades of yellow or brown. It is fine sand or sand. Some pedons have an AE horizon. The combined thickness of the A, AE, and E horizons ranges from 20 to 40 inches.

The Bt horizon overlies the Btg horizon. It has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. It has mottles in shades of gray, brown, yellow, or red. It is fine sandy loam or sandy clay loam. It is less than 18 inches thick.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of brown, yellow, or red. It is fine sandy loam or sandy clay loam in the upper part and sandy clay or clay in the lower parts. The upper boundary is within a depth of 40 inches. The combined thickness of the Bt and Btg horizons ranges from 6 to 52 inches.

The 2R horizon is white or very pale brown limestone bedrock that has an irregular surface. In some pedons a 2Cr horizon overlies the bedrock. This horizon is soft limestone that can be dug with difficulty with a spade.

Myakka Series

The Myakka series consists of deep or very deep, poorly drained soils that formed in sandy marine sediments. These soils are on flatwoods and low flats. They are subject to rare or occasional flooding in some areas. Slope ranges from 0 to 2 percent. The soils are sandy, siliceous, hyperthermic Aeric Haplaquods.

Myakka soils are geographically associated with Adamsville, EauGallie, Holopaw, Immokalee, Janney, Placid, Pompano, Smyrna, and Zolfo soils. Adamsville and Zolfo soils are in the slightly higher landscape positions and are somewhat poorly drained. Adamsville, Holopaw, Placid, and Pompano soils do not have a spodic horizon. EauGallie and Holopaw soils have a loamy argillic horizon. Immokalee soils have a spodic horizon that is at a depth of more than 30 inches. Janney soils have limestone bedrock within a depth of 40 inches. Placid soils are in depressions and are very poorly drained. Smyrna soils have a spodic horizon within a depth of 20 inches.

Typical pedon of Myakka sand, approximately 1,200 feet west and 600 feet north of the southeast corner of sec. 5, T. 15 S., R. 13 E.

A—0 to 5 inches; sand, very dark gray (10YR 3/1) rubbed; the mixture of coated and uncoated sand grains has a salt-and-pepper appearance; weak fine granular structure; very friable; strongly acid; clear smooth boundary.

E1—5 to 18 inches; grayish brown (10YR 5/2) sand; single grained; loose; strongly acid; clear smooth boundary.

E2—18 to 26 inches; light gray (10YR 7/2) sand; single grained; loose; very strongly acid; clear wavy boundary.

Bh1—26 to 40 inches; black (N 2/0) sand; weak medium subangular blocky structure; friable; very strongly acid; clear wavy boundary.

Bh2—40 to 58 inches; very dark gray (N 3/0) sand; weak medium subangular blocky structure; friable; very strongly acid; clear wavy boundary.

C—58 to 80 inches; pale brown (10YR 6/3) sand; single grained; loose; moderately acid.

The solum ranges from 30 to more than 80 inches in thickness. The depth to bedrock is more than 40 inches. Reaction generally ranges from extremely acid to moderately acid, but in limestone phases it ranges from strongly acid to mildly alkaline.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. It is sand, fine sand, or mucky sand. It ranges from 3 to 8 inches in thickness. Some pedons have a layer of muck on the surface that is less than 3 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In some pedons it has mottles in shades of gray or brown. It is sand or fine sand. The combined thickness of the A and E horizons ranges from 20 to 30 inches.

The Bh horizon has hue of 10YR to 5YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 3, or it has hue of 5YR, value of 3, and chroma of 4. It is sand, fine sand, loamy sand, or loamy fine sand. It ranges from 6 to more than 52 inches in thickness.

Some pedons have a BC horizon or a C/B horizon underlying the Bh horizon. The BC horizon or the B part of the C/B horizon has hue of 10YR to 5YR, value of 4 or 5, and chroma of 3 to 6 or hue of 10YR or 7.5YR, value of 3, and chroma of 4. The B part of the C/B horizon consists of organically coated pockets that have colors similar to those of the Bh horizon. The texture is sand or fine sand.

The C horizon, if it occurs, has hue of 10YR, value of 4 to 7, and chroma of 1 to 4. It has mottles in shades of gray, brown, or yellow. It is sand or fine sand.

Some pedons have an E′ and a B′h horizon underlying the Bh horizon. The E′ horizon has colors and textures similar to those of the BC or C horizon. The B′h horizon has colors and textures similar to those of the Bh horizon.

Orlando Series

The Orlando series consists of very deep, well drained soils that formed in sandy marine sediments. These soils are on uplands. Slope ranges from 1 to 8 percent. The soils are sandy, siliceous, hyperthermic Quartzipsammentic Haplumbrepts.

Orlando soils are geographically associated with Adamsville, Apopka, Astatula, Bonneau, Candler, Millhopper, Placid, Sparr, and Tavares soils. Apopka, Bonneau, Millhopper, and Sparr soils have a loamy argillic horizon. Millhopper soils are moderately well drained. Adamsville and Sparr soils are somewhat poorly drained and are in the lower landscape positions. Adamsville, Astatula, Candler, and Tavares soils are less than 5 percent silt and clay between depths of 10 and 40 inches. Tavares soils are moderately well drained. Placid soils are very poorly drained and are in depressions.

Typical pedon of Orlando fine sand, 1 to 5 percent slopes, approximately 2,500 feet south and 500 feet east of the northwest corner of sec. 17, T. 13 S., R. 18 E.

A—0 to 11 inches; fine sand, very dark gray (10YR 3/1) rubbed; weak fine granular structure; very friable; common fine and very fine and few medium roots; strongly acid; clear wavy boundary.

C1—11 to 21 inches; dark brown (10YR 4/3) fine sand; many fine faint very dark grayish brown (10YR 3/2) pockets and streaks; most sand grains are thinly coated; single grained; loose; few fine and very fine roots; strongly acid; diffuse wavy boundary.

C2—21 to 28 inches; dark brown (10YR 4/3) fine sand; most sand grains are thinly coated; single grained; loose; few fine and very fine roots; strongly acid; diffuse wavy boundary.

C3—28 to 34 inches; dark yellowish brown (10YR 4/4) fine sand; most sand grains are thinly coated; single grained; loose; few fine and very fine roots; strongly acid; diffuse wavy boundary.

C4—34 to 72 inches; strong brown (7.5YR 5/6) fine sand; few fine prominent light yellowish brown (10YR 6/4) sand strippings; few fine prominent black (10YR 2/1) charcoal fragments; most sand grains are thinly coated; single grained; loose; few fine and very fine roots; strongly acid; diffuse wavy boundary.

C5—72 to 80 inches; light yellowish brown (10YR 6/4) fine sand; many fine and medium prominent strong brown (7.5YR 5/6) pockets and streaks; single grained; loose; few fine and very fine roots; strongly acid.

The total content of silt and clay is 5 to 10 percent between depths of 10 and 40 inches. Reaction ranges from strongly acid to slightly acid in the A horizon and from strongly acid to moderately acid in the C horizon.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It ranges from 10 to 24 inches in thickness.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 8 or hue of 10YR, value of 4, and chroma of 3 or 4. Some pedons have hue of 10YR, value of 7, and chroma of 4 to 8 and sand strippings in shades of gray to white below a depth of 50 inches. Some pedons have thin, sandy or loamy lamellae at a depth of more than 60 inches.

Orsino Series

The Orsino series consists of very deep, moderately well drained soils that formed in sandy marine sediments. These soils are on dunes and ridges. Slope ranges from 1 to 8 percent. The soils are hyperthermic, uncoated Spodic Quartzipsamments.

Orsino soils are geographically associated with Adamsville, Cassia, Immokalee, Myakka, Otela, Paola, Placid, Pomello, Tidewater, and Zolfo soils. Adamsville, Cassia, Pomello, and Zolfo soils are somewhat poorly drained and are in the slightly lower landscape positions. Cassia, Pomello, and Zolfo soils have a spodic horizon. Otela soils have a loamy argillic horizon at a depth of 40 to 80 inches. Paola soils are excessively drained and are in the higher landscape positions. Placid soils are in depressions, are very poorly drained, and have an umbric epipedon. Immokalee and Myakka soils are in the lower landscape positions, are poorly drained, and have a spodic horizon. Tidewater soils are loamy to a depth of 40 inches or more, are flooded by high tides, and are very poorly drained.

Typical pedon of Orsino fine sand, 0 to 8 percent

slopes, approximately 3,300 feet north and 250 feet east of the southwest corner of sec. 11, T. 14 S., R. 16 E.

A—0 to 4 inches; gray (10YR 5/1) fine sand; weak fine granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.

E1—4 to 8 inches; very pale brown (10YR 7/2) fine sand; single grained; loose; strongly acid; clear wavy boundary.

E2—8 to 13 inches; white (10YR 8/1) fine sand; single grained; loose; common fine roots; strongly acid; abrupt irregular boundary.

Bw&Bh—13 to 48 inches; brownish yellow (10YR 6/6) fine sand (Bw); single grained; loose; common fine roots; discontinuous lenses of weakly cemented dark yellowish brown (10YR 4/4) fine sand (Bh) that are 1 to 5 centimeters thick are at the upper contact of the horizon; strongly acid; gradual wavy boundary.

Bw1—48 to 58 inches; light yellowish brown (10YR 6/4) fine sand; few fine faint brownish yellow (10YR 6/6) mottles; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

Bw2—58 to 70 inches; brownish yellow (10YR 6/8) fine sand; common fine distinct strong brown (7.5YR 5/8) mottles; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

C—70 to 80 inches; white (10YR 8/1) fine sand; few medium distinct yellow (10YR 7/8) mottles; single grained; loose; moderately acid.

The solum ranges from 40 to more than 80 inches in thickness. Reaction ranges from extremely acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 4, and chroma of 1 or 2 or value of 5 or 6 and chroma of 1. It ranges from 2 to 8 inches in thickness.

The E horizon has hue of 10YR, value of 7 or 8, and chroma of 1 or 2. It is sand or fine sand. The combined thickness of the A and E horizons ranges from 10 to 40 inches. Some pedons have vertical intrusions of the E horizon that extend into the underlying Bw&Bh or Bw horizon.

The Bw&Bh horizon, if it occurs, overlies the Bw horizon. The Bh part of this horizon is medium to coarse, weakly cemented material that has hue of 10YR, value of 3, and chroma of 2 to 4. The Bw part of this horizon and the Bw horizon have hue of 10YR, value of 4 to 7, and chroma of 4 to 8. The combined thickness of the Bw horizon and the Bw&Bh horizon is more than 16 inches. The texture is sand or fine sand. Many pedons have white or very pale brown sand strippings in the lower parts of the Bw horizon. The texture is sand or fine sand.

Many pedons have a C horizon at a depth of more than 40 inches. The C horizon has hue of 10YR, value of 7 or 8, and chroma of 1 to 4. In some pedons it has mottles in shades of yellow or brown. It is sand or fine sand.

Otela Series

The Otela series consists of very deep, moderately well drained soils that formed in sandy and loamy marine sediments. These soils are on karst uplands. Slope ranges from 0 to 5 percent. The soils are loamy, siliceous, thermic Arenic Hapludalfs.

Otela soils are geographically associated with Candler, Hague, Jonesville, Lutterloh, Mabel, Moriah, Pedro, Seaboard, Shadeville, and Tavares soils. Candler, Seaboard, and Tavares soils do not have an argillic horizon. Candler soils are excessively drained. Hague, Jonesville, Moriah, and Shadeville soils have a loamy argillic horizon at a depth of 40 to 80 inches. Jonesville soils have bedrock within a depth of 40 inches. Lutterloh, Mabel, and Moriah soils are somewhat poorly drained. Pedro and Seaboard soils have limestone within a depth of 20 inches. Mabel soils have a clayey argillic horizon within a depth of 20 inches.

Typical pedon of Otela fine sand, in an area of Otela-Candler complex, 1 to 5 percent slopes; approximately 75 feet north and 2,200 feet east of the southwest corner of sec. 20, T. 11 S., R. 15 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; strongly acid; abrupt smooth boundary.

E1—8 to 21 inches; brown (10YR 5/3) fine sand; single grained; loose; common dark grayish brown (10YR 4/2) vertical streaks that are 1 to 5 centimeters in diameter; strongly acid; clear wavy boundary.

E2—21 to 32 inches; very pale brown (10YR 8/3) fine sand; single grained; loose; common medium distinct white (10YR 8/1) pockets of uncoated sand grains; common medium distinct yellow (10YR 7/6) mottles; common dark grayish brown (10YR 4/2) vertical streaks that are 1 to 5 centimeters in diameter; strongly acid; gradual smooth boundary.

E3—32 to 50 inches; white (10YR 8/1) fine sand; common fine distinct brownish yellow (10YR 6/6) mottles; single grained; loose; few brownish yellow (10YR 6/6) lamellae about 4 millimeters thick; very strongly acid; abrupt smooth boundary.

Bt1—50 to 61 inches; brownish yellow (10YR 6/6) fine sandy loam; weak medium subangular blocky structure; friable; clean sand grains on faces of peds; extremely acid; clear smooth boundary.

Bt2—61 to 68 inches; brownish yellow (10YR 6/6)

sandy clay loam; common medium distinct light gray (10YR 7/2) mottles; common fine distinct reddish yellow (7.5YR 6/6) mottles; moderate fine subangular blocky structure; friable; very strongly acid; clear smooth boundary.

Btg—68 to 80 inches; light gray (10YR 7/2) sandy clay loam; common fine prominent reddish yellow (7.5YR 6/6) mottles; weak coarse subangular blocky structure; friable; extremely acid.

The thickness of the solum and the depth to limestone bedrock range from 60 to more than 80 inches. Reaction ranges from very strongly acid to neutral in the A and E horizons and from extremely acid to moderately alkaline in the lower part of the Bt and 2Btg horizons. The content of clay in the upper 20 inches of the argillic horizon is 15 to 35 percent, by weighted average.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. It ranges from 1 to 10 inches in thickness.

The E horizon has hue of 10YR, value of 6 or 7, and chroma of 2 to 8; value of 5 and chroma of 2 to 4; or value of 8 and chroma of 1 to 3. In some pedons it has mottles in shades of brown or yellow. The texture is mainly fine sand, but some pedons have thin lamellae of loamy fine sand or sandy loam in the lower parts of the E horizon. Some pedons have a thin EB horizon that overlies the Bt horizon. The EB horizon has colors similar to those of the Bt horizon. It is loamy fine sand. In some pedons the content of gravel-sized ironstone nodules in the lower parts of the E horizon or in the EB horizon is as much as 5 percent. The combined thickness of the A, E, and EB horizons ranges from 40 to 78 inches.

The Bt horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 8. In some pedons it has mottles in shades of gray, brown, or yellow. It is fine sandy loam or sandy clay loam. In some pedons the content of gravel- to stone-sized limestone or chert fragments is less than 5 percent. The Bt horizon is more than 6 inches thick.

The Btg horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In some pedons it has mottles in shades of gray, yellow, or brown. It is fine sandy loam, sandy clay loam, or sandy clay. Some pedons have a 2Btg or 2Cg horizon that is sandy clay or clay. In some pedons the content of gravel- or cobble-sized limestone or chert fragments in the Btg or 2Btg horizon is less than 5 percent.

Some pedons have a BC, BCg, 2BC, or 2BCg horizon underlying the Bt, Btg, 2Bt, or 2Btg horizon at a depth of more than 60 inches. The texture is fine sand or loamy fine sand.

Ousley Series

The Ousley series consists of very deep, somewhat poorly drained, occasionally flooded soils that formed in sandy marine sediments. These soils are on slightly elevated knolls and ridges on the flood plain of the Suwannee River. Slope ranges from 0 to 2 percent. The soils are thermic, uncoated Aquic Quartzipsamments.

Ousley soils are geographically associated with Albany, Bradenton, Chobee, Gator, Holopaw, Myakka, Orsino, Pineda, Pompano, and Terra Ceia soils. Albany and Holopaw soils have a loamy argillic horizon at a depth of 40 to 80 inches. Bradenton, Holopaw, Myakka, Pineda, and Pompano soils are poorly drained and are in the lower landscape positions. Gator and Terra Ceia soils have a histic epipedon and are very poorly drained. Myakka soils have a spodic horizon. Chobee soils have a loamy mollic epipedon, are very poorly drained, and are in the lower landscape positions. Bradenton soils have a loamy argillic horizon within a depth of 20 inches. Pineda soils have a loamy argillic horizon at a depth of 20 to 40 inches. Orsino soils are moderately well drained, are in the higher landscape positions, and are not subject to flooding.

Typical pedon of Ousley fine sand, in an area of Ousley-Albany complex, occasionally flooded; approximately 250 feet south and 1,350 feet west of the northeast corner of sec. 10, T. 12 S., R. 13 E.

A1—0 to 4 inches; fine sand, gray (10YR 5/1) rubbed; unrubbed, it is a mixture of white and very dark gray sand grains; many medium faint light brownish gray (10YR 6/2) pockets; single grained; loose; many fine and very fine and few medium roots; moderately acid; clear smooth boundary.

A2—4 to 12 inches; light gray (10YR 7/1) fine sand with many medium and coarse faint gray (10YR 6/1) pockets; single grained; loose; common fine and very fine roots; moderately acid; clear smooth boundary.

C1—12 to 18 inches; dark brown (10YR 5/3) fine sand; many fine distinct light brownish gray (10YR 6/2) sand strippings are in upper parts of the horizon; single grained; loose; few fine and very fine roots; moderately acid; gradual wavy boundary.

C2—18 to 28 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose; few fine and very fine roots; moderately acid; diffuse wavy boundary.

C3—28 to 38 inches; light yellowish brown (10YR 6/4) fine sand; common fine and medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; single grained; loose; moderately acid; diffuse wavy boundary.

C4—38 to 65 inches; pale brown (10YR 6/3) fine sand;

common fine and medium prominent yellowish brown (10YR 5/8) mottles; single grained; loose; moderately acid; diffuse wavy boundary.

C5—65 to 80 inches; light gray (10YR 7/2) fine sand; single grained; loose; moderately acid.

The sandy horizons are more than 80 inches thick. Reaction ranges from very strongly acid to moderately acid throughout the profile. The average content of silt and clay is 2 to 5 percent between depths of 10 and 40 inches.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 4 to 8 inches in thickness. The A2 horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or value of 7 and chroma of 2. It is sand or fine sand. It is less than 16 inches thick.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 4. Matrix colors with chroma of 1 or 2 are at a depth of more than 40 inches. Mottles are in shades of gray, brown, or yellow. The C horizon is sand or fine sand.

Paola Series

The Paola series consists of very deep, excessively drained soils that formed in sandy marine sediments. These soils are on the top of dune ridges. Slope ranges from 5 to 8 percent. The soils are hyperthermic, uncoated Spodic Quartzipsamments.

Paola soils are geographically associated with Adamsville, Orsino, Otela, and Tavares soils. These associated soils are in the lower landscape positions. Adamsville soils are somewhat poorly drained. Orsino, Otela, and Tavares soils are moderately well drained. Otela soils have a loamy argillic horizon. Tavares soils do not have an albic horizon.

Typical pedon of Paola fine sand, gently rolling, approximately 2,000 feet west and 1,000 feet north of the southeast corner of sec. 9, T. 14 S., R. 13 E.

A—0 to 2 inches; fine sand, gray (10YR 5/1) rubbed; unrubbed, the mixture of coated and uncoated sand grains has a salt-and-pepper appearance; single grained; loose; common fine, very fine, and medium roots; very strongly acid; abrupt smooth boundary.

E—2 to 11 inches; light gray (10YR 7/2) fine sand; single grained; loose; common fine, very fine, and medium roots; very strongly acid; clear irregular boundary.

B/E—11 to 16 inches; yellowish brown (10YR 5/4) fine sand (Bw); common medium and coarse faint very pale brown (10YR 7/3) pockets and vertical extensions of the E horizon; single grained; loose; common fine, very fine, and medium roots; very strongly acid; clear wavy boundary.

Bw1—16 to 26 inches; yellowish brown (10YR 5/8) fine sand; single grained; loose; few fine, very fine, and medium roots; very strongly acid; gradual wavy boundary.

Bw2—26 to 68 inches; brownish yellow (10YR 6/6) fine sand; single grained; loose; common fine and very fine roots; very strongly acid; gradual wavy boundary.

Bw3—68 to 80 inches; yellow (10YR 7/6) fine sand; single grained; loose; few fine and very fine roots; very strongly acid.

The solum ranges from 40 to more than 80 inches in thickness. Reaction ranges from extremely acid to neutral throughout the profile.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or value of 5 and chroma of 2. It ranges from 2 to 5 inches in thickness.

The E horizon has hue of 10YR, value of 7 or 8, and chroma of 1 to 3. It is fine sand or sand. It ranges from 6 to 30 inches in thickness.

The Bw horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8 or value of 7 and chroma of 6. The B/E horizon, if it occurs, has matrix color in the Bw part similar to that of the Bw horizon and has medium to coarse vertical intrusions of soil that has color similar to that of the E horizon. Some pedons have pockets or thin layers that are weakly coated with organic matter in the B/E horizon or in the upper parts of the Bw horizon. These pockets or layers have hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 to 4. Many pedons have sand strippings in shades of white, gray, or very pale brown in the lower parts of the Bw horizon. The texture of the Bw or B/E horizon is sand or fine sand.

Some pedons have a C horizon at a depth of more than 40 inches. This horizon has hue of 10YR, value of 7 or 8, and chroma of 3 or 4. It is sand or fine sand.

Pedro Series

The Pedro series consists of shallow or very shallow, well drained soils that formed in sandy and loamy marine sediments underlain by limestone. These soils are on karst uplands. Slope ranges from 0 to 5 percent. The soils are loamy, siliceous, hyperthermic, shallow Typic Hapludalfs.

Pedro soils are geographically associated with Bushnell, Jonesville, Levyville, Lutterloh, Mabel, Moriah, Otela, Seaboard, Shadeville, and Tavares soils. Bushnell, Lutterloh, Mabel, and Moriah soils are somewhat poorly drained. Bushnell and Mabel soils have a clayey argillic horizon. Bushnell, Jonesville, Mabel, Moriah, and Shadeville soils do not have limestone within a depth of 20 inches. Jonesville, Moriah, and Shadeville soils have a sandy epipedon

that is 20 to 40 inches thick. Levyville soils do not have limestone within a depth of 60 inches. Lutterloh and Otela soils have a sandy epipedon that is 40 to 79 inches thick. Seaboard soils do not have an argillic horizon. Tavares soils are sandy to a depth of more than 80 inches.

Typical pedon of Pedro fine sand, in an area of Pedro-Jonesville-Shadeville complex, 0 to 5 percent slopes; approximately 150 feet north and 150 feet east of the southwest corner of sec. 18, T. 13 S., R. 19 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; common fine and very fine roots; moderately acid; abrupt smooth boundary.

E—8 to 11 inches; brownish yellow (10YR 6/8) fine sand; few pebble-sized strong brown nodules that can be crushed between thumb and forefinger; single grained; loose; few fine and very fine roots; moderately acid; clear wavy boundary.

Bt—11 to 15 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine subangular blocky structure; very friable; few fine and very fine roots; 1 or 2 percent cobble- and gravel-sized limestone fragments; moderately acid; discontinuous; abrupt wavy boundary.

2Cr—15 to 21 inches; light gray and very pale brown, soft limestone that can be dug with difficulty with a spade. This layer is discontinuous within the pedon.

2R—21 inches; limestone bedrock that can be excavated with light power equipment.

The soil is cyclic. The thickness of the solum and the depth to soft, weathered limestone bedrock are generally 6 to 20 inches. In about 5 to 10 percent of the pedons, solution holes extend to a depth of as much as 60 inches. In many pedons the content of cobble- to boulder-sized limestone or chert fragments on the surface or within the solum is as much as 1 percent. Reaction ranges from strongly acid to slightly acid in the A and E horizons and from slightly acid to mildly alkaline in the Bt horizon.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 3. It ranges from 4 to 9 inches in thickness.

Some pedons have an E horizon that has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. The combined thickness of the A and E horizons ranges from 4 to 16 inches.

The Bt horizon has hue of 10YR or 7.5YR and value and chroma of 4 to 6. It is fine sandy loam or sandy clay loam. In some pedons the content of gravel-sized limestone fragments is as much as 15 percent by volume. This horizon ranges dominantly from 3 to 13 inches, but many pedons have solution holes that extend to a depth of more than 20 inches.

The 2Cr horizon is generally white, light gray, or very pale brown. It commonly has hard cobble- or stone-sized limestone fragments. It is discontinuous in most pedons. It is extremely variable in thickness over short lateral distances, but it is dominantly less than 2 feet thick.

The 2R horizon is generally at a depth of 20 to 40 inches.

Pender Series

The Pender series consists of very deep, somewhat poorly drained soils that formed in sandy and loamy marine sediments. These soils are on uplands. Slope ranges from 0 to 2 percent. The soils are fine-loamy, siliceous, thermic, Albaquic Hapludalfs.

Pender soils are geographically associated with Hague, Hicoria, Holopaw, Levyville, Lochloosa, Pineda, Placid, Pompano, Popash, and Sparr soils. Holopaw, Pineda, and Pompano soils are poorly drained and are in the slightly lower landscape positions. Hicoria, Placid, and Popash soils are very poorly drained, have an umbric epipedon, and are in depressions. Pineda and Hicoria soils have a loamy argillic horizon at a depth of 20 to 40 inches. Holopaw and Popash soils have a loamy argillic horizon at a depth of 40 to 80 inches. Pompano and Placid soils are sandy to a depth of more than 80 inches. Hague and Levyville soils are well drained and are in the higher landscape positions. Hague soils have a sandy epipedon that is 20 to 39 inches thick. Lochloosa soils have a sandy epipedon that is 20 to 39 inches thick. Sparr soils have a sandy epipedon that is 40 to 79 inches thick.

Typical pedon of Pender loamy fine sand, approximately 500 feet north and 2,650 feet east of the southwest corner of sec. 6, T. 12 S., R. 15 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loamy fine sand; weak fine granular structure; many fine and very fine roots; slightly acid; gradual wavy boundary.

E—9 to 14 inches; dark grayish brown (10YR 5/2) loamy fine sand; few fine faint dark yellowish brown (10YR 4/4) pockets of fine sandy loam; weak fine granular structure; common fine and very fine roots; slightly acid; abrupt wavy boundary.

Bt1—14 to 18 inches; yellowish brown (10YR 5/6) sandy clay loam; few fine faint strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable, sticky and plastic; common fine and very fine roots; slightly acid; clear wavy boundary.

Bt2—18 to 48 inches; brownish yellow (10YR 6/6) sandy clay loam; many medium prominent yellowish red (5YR 5/8) and few fine prominent light gray

(10YR 7/2) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; few fine and very fine roots; moderately acid; gradual wavy boundary.

BCg—48 to 58 inches; gray (10YR 5/1) sandy clay loam with thin strata of sandy loam; common medium prominent yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; friable, sticky and plastic; moderately acid; clear irregular boundary.

Cg—58 to 80 inches; light gray (10YR 6/1) sandy clay loam; massive; friable, very sticky and plastic; moderately acid.

The solum ranges from 40 to 60 inches in thickness. Reaction ranges from very strongly acid to slightly acid in the A, E, and Bt horizons and from moderately acid to mildly alkaline in the underlying layers.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2. It ranges from 5 to 10 inches in thickness.

The E horizon, if it occurs, underlies the A horizon. It has hue of 10YR, value of 5, and chroma of 2 or 3. It is fine sand or loamy fine sand. The combined thickness of the A and E horizons is less than 20 inches.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 8. It has mottles in shades of brown, yellow, or red. Mottles in shades of gray are in the upper 10 inches of the horizon. The average content of clay ranges from 20 to 35 percent in the upper 20 inches of the argillic horizon. The Bt horizon ranges from 21 to 35 inches in thickness.

The BCg horizon is loamy fine sand to sandy clay loam. It has colors similar to those of the Bt horizon. It is less than 20 inches thick. Some pedons do not have a BCg horizon.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of brown, red, or yellow. It is sandy loam or sandy clay loam. The 2Cg horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The texture ranges from sandy to clayey material.

Pineda Series

The Pineda series consists of deep or very deep, poorly drained soils that formed in sandy and loamy marine sediments. These soils are on sloughs on flatwoods, on low ridges, and on flood plains. They are subject to rare, occasional, or frequent flooding in some areas. Slope ranges from 0 to 2 percent. The soils are loamy, siliceous, hyperthermic Arenic Glossaqualfs.

Pineda soils are geographically associated with Albany, Boca, Bradenton, Chobee, EauGallie, Gator, Hicoria, Holopaw, Placid, Popash, and Wekiva soils. Albany soils are in the slightly higher landscape positions and are somewhat poorly drained. Boca soils have limestone bedrock within a depth of 40 inches. Chobee soils are very poorly drained and have a loamy mollic epipedon. Bradenton and Wekiva soils have a loamy argillic horizon within a depth of 20 inches. Wekiva soils have limestone bedrock within a depth of 30 inches. EauGallie soils have a spodic horizon. Gator soils are in the lower landscape positions, are very poorly drained, and have a histic epipedon. Holopaw soils have a sandy epipedon that is 40 to 80 inches thick. Hicoria, Placid, and Popash soils are in depressions, are very poorly drained, and have a mollic epipedon.

Typical pedon of Pineda fine sand, approximately 600 feet east and 1,000 feet south of the northwest corner of sec. 18, T. 14 S., R. 16 E.

Ap—0 to 4 inches; fine sand, very dark gray (10YR 3/1) rubbed; unrubbed, the mixture of coated and uncoated sand grains has a salt-and-pepper appearance; single grained; loose; common fine and very fine roots; slightly acid; clear wavy boundary.

E—4 to 18 inches; dark gray (10YR 4/1) fine sand; single grained; loose; few fine and very fine roots; slightly acid; gradual wavy boundary.

Bw—18 to 32 inches; brown (10YR 4/3) fine sand; many medium and coarse faint grayish brown (10YR 5/2) pockets and streaks; single grained; loose; few fine and very fine roots; neutral; clear wavy boundary.

B/E—32 to 35 inches; dark grayish brown (2.5Y 4/2) fine sandy loam (Btg); common medium and coarse distinct brown (10YR 4/3) and grayish brown (10YR 5/2) pockets of fine sand (E); common fine faint olive brown (2.5Y 4/4) and very dark gray (10YR 3/1) mottles and streaks; weak fine subangular blocky structure; slightly sticky and slightly plastic; sandy intrusions are single grained and loose; few fine and very fine roots; neutral; diffuse irregular boundary.

Btg1—35 to 55 inches; dark grayish brown (2.5Y 4/2) fine sandy loam; common fine faint olive brown (2.5Y 4/4) and very dark gray (10YR 3/1) mottles and streaks; weak fine subangular blocky structure; slightly sticky and slightly plastic; few fine and very fine roots; neutral; diffuse wavy boundary.

Btg2—55 to 80 inches; greenish gray (5GY 5/1) sandy clay loam; common fine and medium distinct light olive brown (2.5Y 5/4) mottles; massive; slightly sticky and plastic; few fine and very fine roots; neutral.

The thickness of the solum and the depth to bedrock range from 40 to more than 80 inches. Reaction ranges

from very strongly acid to slightly acid in the A and E horizons, from very strongly acid to neutral in the Bw horizon, and from moderately acid to mildly alkaline in the underlying horizons.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It ranges from 3 to 10 inches in thickness.

The E horizon, if it occurs, has hue of 10YR, value of 4 to 8, and chroma of 1 or 2. In some pedons it has mottles in shades of gray, brown, or yellow. It is sand or fine sand.

The Bw horizon has hue of 10YR, value of 4 to 7, and chroma of 3 or 4. It is sand or fine sand. It is more than 4 inches thick.

Some pedons have an E′ horizon underlying the Bw horizon. The E′ horizon has colors and textures similar to those of the E horizon. Some pedons have a Bh horizon. The combined thickness of the A, E, Bw, and Bh horizons is 20 to 40 inches.

The Btg part of the B/E horizon has hue of 10YR to 5GY, value of 4 to 7, and chroma of 1 or 2. It is fine sandy loam, sandy loam, or sandy clay loam. The E part consists of common vertical intrusions and pockets of fine sand or loamy fine sand that have colors similar to those of the E horizon. The B/E horizon ranges from 2 to 10 inches in thickness.

The Btg horizon has colors and textures similar to those of the Btg part of the B/E horizon.

Some pedons have a Cg horizon that has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1. This horizon is sand, fine sand, or loamy fine sand. Some pedons have layers of shell fragments or limestone bedrock at a depth of more than 40 inches.

Placid Series

The Placid series consists of very deep, very poorly drained soils that formed in sandy marine sediments. These soils are on broad, low flats and in depressions on flatwoods. Slope is 0 or 1 percent. The soils are sandy, siliceous, hyperthermic Typic Humaquepts.

Placid soils are geographically associated with Adamsville, Hicoria, Holopaw, Myakka, Pompano, Popash, Samsula, Smyrna, and Sparr soils. Adamsville and Sparr soils are in the higher landscape positions and are somewhat poorly drained. Sparr soils have a loamy argillic horizon at a depth of more than 40 inches. Hicoria soils have a loamy argillic horizon that is within a depth of 40 inches. Holopaw, Myakka, Pompano, and Smyrna soils are poorly drained, are in the slightly higher landscape positions, and do not have an umbric epipedon. Myakka and Smyrna soils have a spodic horizon. Holopaw soils have a loamy argillic horizon. Samsula soils have a histic epipedon that is more than 16 inches thick.

Typical pedon of Placid fine sand, approximately 2,400 feet east and 2,100 feet south of the northwest corner of sec. 22, T. 14 S., R. 17 E.

A1—0 to 4 inches; black (N 2/0) fine sand; weak fine granular structure; very friable; very strongly acid; clear smooth boundary.

A2—4 to 19 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; strongly acid; clear wavy boundary.

C—19 to 26 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; moderately acid; gradual wavy boundary.

Cg—26 to 80 inches; light gray (2.5Y 7/2) fine sand; single grained; loose; moderately acid.

The soil is more than 80 inches deep over bedrock. Reaction ranges from extremely acid to strongly acid in the A horizon and from extremely acid to slightly acid the underlying horizons.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. In some pedons it has streaks and pockets of gray or dark brown fine sand in the lower part of the A horizon. It ranges from 10 to 24 inches in thickness. Some pedons have a thin Oa horizon at the surface. This horizon is muck. It is less than 3 inches thick.

The C horizon has value of 6 to 8 and chroma of 3. In some pedons it has mottles in shades of brown or gray. The Cg horizon has hue of 10YR to 2.5Y or is neutral in hue. It has value of 4 or 5 and chroma of 0 to 2. The C and Cg horizons are dominantly fine sand or sand, but in some pedons the range includes loamy fine sand in the lower parts of the Cg horizon.

Pomello Series

The Pomello series consists of very deep, somewhat poorly drained soils that formed in sandy marine sediments. These soils are on low ridges and knolls on flatwoods. Slope ranges from 0 to 2 percent. The soils are sandy, siliceous, hyperthermic Arenic Haplohumods.

Pomello soils are geographically associated with Cassia, Immokalee, Myakka, Orsino, Placid, Pompano, Smyrna, and Zolfo soils. Cassia, Myakka, and Smyrna soils have a spodic horizon that is within a depth of 30 inches. Myakka, Immokalee, Pompano, and Smyrna soils are in the slightly lower landscape positions and are poorly drained. Orsino, Placid, and Pompano soils do not have a spodic horizon. Orsino soils are moderately well drained and are in the higher landscape positions. Placid soils are in depressions and are very

poorly drained. Zolfo soils have a spodic horizon at a depth of 50 to 80 inches.

Typical pedon of Pomello fine sand, in an area of Cassia-Pomello complex; approximately 2,600 feet south and 2,500 feet east of the northwest corner of sec. 24, T. 14 S., R. 16 E.

A—0 to 4 inches; fine sand, gray (10YR 6/1) rubbed; dry, the mixture of coated and uncoated sand grains has a salt-and-pepper appearance; single grained; loose; common fine and very fine and few medium roots; strongly acid; clear wavy boundary.

E1—4 to 25 inches; light gray (10YR 7/1) fine sand; common medium and coarse faint light brownish gray (10YR 6/2) pockets and streaks; single grained; loose; few fine and very fine roots; moderately acid; diffuse wavy boundary.

E2—25 to 35 inches; light gray (10YR 7/1) fine sand; many medium distinct dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) mottles; single grained; loose; few fine and very fine roots; moderately acid; diffuse wavy boundary.

E/B—35 to 40 inches; gray (10YR 6/1) fine sand (E); many medium and coarse distinct very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) spodic material (Bh); single grained; loose; few fine and very fine roots; moderately acid; clear irregular boundary.

Bh—40 to 46 inches; very dark brown (10YR 2/2) fine sand; many medium and coarse faint very dark grayish brown (10YR 3/2) mottles; weak fine subangular blocky structure; very friable; few fine and very fine roots; moderately acid; gradual wavy boundary.

Bw—46 to 60 inches; dark brown (7.5YR 3/4) fine sand; common medium faint dark brown (7.5YR 3/2) weakly cemented pockets; weak fine subangular blocky structure; very friable; moderately acid; diffuse wavy boundary.

2B′h—60 to 80 inches; dark brown (7.5YR 3/2) fine sand; single grained; loose; moderately acid.

The solum ranges from 40 to more than 80 inches in thickness. Reaction ranges from very strongly acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or value of 5 and chroma of 2. It ranges from 2 to 6 inches in thickness.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 1. It is sand or fine sand. The combined thickness of the A and E horizons is 30 to 50 inches.

The Bh and B′h horizons have hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 to 3. They are sand or fine sand. They range from 6 to 40 inches in thickness.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6 or hue of 7.5YR, value of 3, chroma of 4. In many pedons it has weakly cemented pockets that have colors similar to those of the Bh horizon. The Bw horizon is sand or fine sand. In some pedons it has cobbles or boulders. Many pedons have a B′h horizon underlying the Bw horizon. The B′h horizon has colors and textures similar to those of the Bh horizon.

Pomona Series

The Pomona series consists of very deep, poorly drained soils that formed in sandy and loamy marine sediments. These soils are on flatwoods. Slope ranges from 0 to 2 percent. The soils are sandy, siliceous, hyperthermic Ultic Haplaquods.

Pomona soils are geographically associated with Adamsville, Myakka, Placid, Pompano, Popash, Smyrna, Sparr, and Wauchula soils. Adamsville and Sparr soils are in the higher landscape positions and are somewhat poorly drained. Adamsville, Placid, Pompano, Popash, and Sparr soils do not have a spodic horizon. Adamsville, Myakka, Placid, Pompano, and Smyrna soils are sandy to a depth of more than 80 inches. Placid and Popash soils are on the lower landscape positions and are very poorly drained. Wauchula soils have an argillic horizon at a depth of 20 to 40 inches.

Typical pedon of Pomona fine sand, approximately 1,200 feet south and 100 feet east of the northwest corner of sec. 36, T. 12 S., R. 16 E.

Ap—0 to 4 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; moderately acid; abrupt smooth boundary.

E—4 to 23 inches; gray (10YR 6/1) fine sand; single grained; loose; moderately acid; abrupt smooth boundary.

Bh—23 to 27 inches; dark brown (10YR 3/3) fine sand; weak fine subangular blocky structure; very friable; sand grains coated with organic matter; moderately acid; clear wavy boundary.

Bw—27 to 30 inches; dark yellowish brown (10YR 4/4) fine sand; weak fine subangular blocky structure; very friable; moderately acid; clear smooth boundary.

E′—30 to 55 inches; very pale brown (10YR 7/3) fine sand; common medium distinct dark yellowish brown (10YR 3/4) mottles; single grained; loose; moderately acid; clear smooth boundary.

EB—55 to 61 inches; grayish brown (10YR 5/2) loamy fine sand; common medium distinct dark yellowish brown (10YR 4/4) mottles; weak fine subangular

blocky structure; friable; moderately acid; clear wavy boundary.

Btg—61 to 80 inches; gray (10YR 6/1) sandy clay loam; common medium distinct light olive brown (2.5Y 5/4) and common fine distinct strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; slightly sticky and slightly plastic; moderately acid.

The solum ranges from 45 to more than 80 inches in thickness. Reaction ranges from extremely acid to moderately acid throughout, except in areas that have been limed.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 to 4 and chroma of 0 or 1. It ranges from 4 to 8 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. In some pedons it has mottles in shades of brown or yellow and streaks of dark gray or very dark gray. It is sand or fine sand. The combined thickness of the A and E horizons ranges from 10 to 30 inches.

The Bh horizon has hue of 10YR to 5YR or is neutral in hue. It has value of 2 and chroma of 0 to 2 or value of 3 and chroma of 0 to 3. It is sand or fine sand. It ranges from 4 to 18 inches in thickness. Some pedons have a B′h horizon that has colors and textures similar to those of the Bh horizon.

In most pedons a BE or E′ horizon underlies the Bh or B′h horizon. The BE horizon has hue of 10YR, value of 3 to 7, and chroma of 4 to 6. The E′ horizon has hue of 10YR, value of 5 to 7, and chroma of 2 or 3. It is sand or fine sand. The combined thickness of the BE and E′ horizons is less than 29 inches.

The depth to the Btg horizon ranges from 40 to 78 inches. The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. In some pedons it has mottles in shades of brown, yellow, or red. It is fine sandy loam or sandy clay loam. It is more than 4 inches thick.

Some pedons have a BCg or Cg horizon below the Btg horizon. The BC horizon is loamy fine sand. The C horizon is fine sand.

Pompano Series

The Pompano series consists of very deep, poorly drained soils that formed in sandy marine sediments. These soils are mostly in sloughs. Slope ranges from 0 to 2 percent. The soils are siliceous, hyperthermic Typic Psammaquents.

Pompano soils are geographically associated with Adamsville, Holopaw, Immokalee, Myakka, Placid, Popash, Smyrna, Sparr, and Zolfo soils. Adamsville, Sparr, and Zolfo soils are in the slightly higher landscape positions and are somewhat poorly drained. Sparr soils have a loamy subsoil layer. Zolfo soils have an organically coated subsoil layer at a depth of 40 to 80 inches. Holopaw and Popash soils have a loamy subsoil layer at a depth of 40 to 80 inches. Immokalee, Myakka, and Smyrna soils have an organically coated subsoil layer. Placid and Popash soils are very poorly drained and are in depressions.

Typical pedon of Pompano fine sand, approximately 1,700 feet east and 2,400 feet north of the southwest corner of sec. 36, T. 11 S., R. 16 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; few fine and medium roots; very strongly acid; gradual irregular boundary.

C1—7 to 13 inches; brown (10YR 5/3) fine sand; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

C2—13 to 38 inches; pale brown (10YR 6/3) fine sand; few fine distinct yellowish brown (10YR 5/6) mottles; many fine distinct white (10YR 8/2) streaks and pockets; single grained; loose; very strongly acid; diffuse wavy boundary.

C3—38 to 66 inches; light gray (10YR 7/2) fine sand; few fine and medium prominent yellow (10YR 7/8) mottles; single grained; loose; very strongly acid; diffuse wavy boundary.

C4—66 to 80 inches; very pale brown (10YR 7/3) fine sand; common fine and medium prominent strong brown (7.5YR 5/8) and yellow (10YR 7/8) mottles; common fine and medium faint white (10YR 8/2) streaks and pockets; single grained; loose; very strongly acid.

The sandy horizons are more than 80 inches deep over bedrock. Reaction ranges from very strongly acid to mildly alkaline throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is 2 to 8 inches in thickness. If value is 3 or less, it is less than 6 inches thick.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 3 or value of 7 or 8 and chroma of 4. It has mottles in shades of brown, yellow, gray, or white. Some pedons have a transitional AC horizon that overlies the C horizon. The AC horizon has hue of 10YR, value of 4, and chroma of 1 to 3. It is less than 12 inches thick.

Popash Series

The Popash series consists of very deep, very poorly drained soils that formed in sandy and loamy marine sediments. These soils are on broad, low flats and in depressions on flatwoods. Slope is 0 or 1 percent. The

soils are loamy, siliceous, hyperthermic Grossarenic Umbraqualfs.

Popash soils are geographically associated with Hicoria, Holopaw, Immokalee, Myakka, Placid, Pompano, Samsula, Smyrna, and Terra Ceia soils. Hicoria soils have a loamy argillic horizon at a depth of 20 to 40 inches. Holopaw and Pompano soils are in the slightly higher landscape positions, are poorly drained, and do not have an umbric epipedon. Immokalee, Myakka, and Smyrna soils are in the higher landscape positions, have a spodic horizon, and do not have an argillic or umbric epipedon. Samsula and Terra Ceia soils have a histic epipedon that is more than 16 inches thick. Placid and Pompano soils do not have an argillic horizon.

Typical pedon of Popash fine sand, in an area of Placid and Popash soils, depressional; approximately 1,400 feet east and 1,000 feet north of the southwest corner of sec. 16, T. 12 S., R. 15 E.

A—0 to 12 inches; fine sand, very dark gray (10YR 3/1) rubbed; single grained; loose; many fine and very fine and many medium roots; slightly acid.

Eg1—12 to 20 inches; fine sand, dark grayish brown (10YR 4/2), grayish brown (10YR 5/2), and dark gray (10YR 4/1) rubbed; common fine and medium faint very dark gray (10YR 3/1) pockets and streaks; single grained; loose; common fine and very fine roots; slightly acid; gradual irregular boundary.

Eg2—20 to 30 inches; grayish brown (10YR 5/2) fine sand; few fine and medium faint dark grayish brown (10YR 4/2) streaks; single grained; loose; few fine and very fine roots; slightly acid; diffuse wavy boundary.

Eg3—30 to 45 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; few fine and very fine roots; slightly acid; clear wavy boundary.

Btg—45 to 80 inches; dark gray (10YR 4/1) sandy clay loam; common fine and medium faint grayish brown (10YR 5/2) mottles; weak fine subangular blocky structure; sticky and plastic; common fine and very fine and few medium roots; neutral.

The solum is more than 80 inches thick. Reaction ranges from extremely acid to slightly acid in the A horizon and from moderately acid to neutral in the E and Btg horizons.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1. Many pedons have pockets or streaks in the lower part of the A horizon. These pockets or streaks have value of 4 to 6 and chroma of 1. The A horizon ranges from 10 to 24 inches in thickness.

The Eg horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It has mottles in shades of gray or brown. It is sand or fine sand. The combined thickness of the A and Eg horizons ranges from 40 to 78 inches.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1. In some pedons it has mottles in shades of brown or yellow. It is sandy loam, fine sandy loam, or sandy clay loam.

Samsula Series

The Samsula series consists of very deep, very poorly drained soils that formed in thick deposits of hydrophytic plant remains underlain by sandy marine sediments. These soils are in depressions on flatwoods. Slope is 0 or 1 percent. The soils are sandy or sandy-skeletal, siliceous, dysic, hyperthermic Terric Medisaprists.

Samsula soils are geographically associated with Gator, Holopaw, Immokalee, Myakka, Placid, Pompano, Popash, Smyrna, and Terra Ceia soils. Gator soils have loamy sediments that underlie the histic epipedon. Holopaw, Immokalee, Myakka, Smyrna, and Pompano soils are poorly drained and are in the higher landscape positions. Holopaw, Immokalee, Myakka, Placid, Pompano, Popash, and Smyrna soils do not have a histic epipedon.

Typical pedon of Samsula muck, in an area of Placid and Samsula soils, depressional; approximately 900 feet east and 1,800 feet south of the northwest corner of sec. 3, T. 13 S., R. 16 E.

Oa1—0 to 6 inches; dark brown (7.5YR 3/2) muck; about 30 percent fiber, less than 5 percent rubbed; massive; nonsticky and nonplastic; many fine and medium roots; extremely acid; clear wavy boundary.

Oa2—6 to 47 inches; black (10YR 2/1) muck; less than 5 percent fiber unrubbed (estimated); massive; nonsticky and nonplastic; few fine and very fine roots; extremely acid; gradual wavy boundary.

Cg1—47 to 62 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; very strongly acid; gradual wavy boundary.

Cg2—62 to 80 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; very strongly acid.

The Oa horizon ranges from 16 to 51 inches in thickness. The content of fiber is less than 33 percent, unrubbed. Reaction in the Oa horizon is extremely acid in 0.01 *M* $CaCl_2$. Reaction is extremely acid or very strongly acid in the C horizon.

The Oa horizon has hue of 10YR to 5YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 4.

The Cg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 3 to 8 and chroma of 0 to 2. It is sand, fine sand, or loamy fine sand.

Seaboard Series

The Seaboard series consists of shallow or very shallow, moderately well drained soils that formed in sandy marine sediments underlain by limestone. These soils are on karst uplands. Slope ranges from 1 to 3 percent. The soils are thermic, uncoated Lithic Quartzipsamments.

Seaboard soils are geographically associated with Bushnell, Jonesville, Lutterloh, Moriah, Otela, Pedro, Shadeville, and Tavares soils. Bushnell soils are somewhat poorly drained and have a clayey argillic horizon within a depth of 20 inches. Bushnell and Jonesville soils have limestone bedrock at a depth of 20 to 40 inches. Shadeville, Jonesville, and Moriah soils have a sandy epipedon that is 20 to 40 inches thick. Shadeville and Moriah soils do not have limestone within a depth of 40 inches. Lutterloh and Otela soils have a sandy epipedon that is more than 40 inches thick. Lutterloh, Otela, and Pedro soils have a loamy argillic horizon. Tavares soils are sandy to a depth of more than 80 inches.

Typical pedon of Seaboard fine sand, in an area of Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes; approximately 1,850 feet west and 100 feet north of the southeast corner of sec. 16, T. 12 S., R. 14 E.

Ap—0 to 8 inches; fine sand, dark grayish brown (10YR 4/2) rubbed; single grained; loose; few fine and medium roots; moderately acid; clear smooth boundary.

C—8 to 17 inches; pale brown (10YR 6/3) fine sand; single grained; loose; few fine and very fine roots; moderately acid; abrupt irregular boundary.

2R—17 inches; fractured white limestone bedrock that can be dug with power equipment.

The depth to bedrock dominantly ranges from 4 to 20 inches, but many pedons have solution holes that extend to a depth of more than 20 inches. Reaction ranges from strongly acid to moderately acid in the A horizon and from moderately acid to neutral in the C horizon. In many pedons the content of gravel- to boulder-sized limestone or chert fragments on the surface or buried within the soil is as much as 5 percent.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3. It ranges from 4 to 9 inches in thickness.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 6 or value of 7 or 8 and chroma of 2. In some pedons it has mottles in shades of brown or yellow. In some pedons it has white or gray sand strippings. It is less than 15 inches thick.

Shadeville Series

The Shadeville series consists of deep or very deep, moderately well drained soils that formed in sandy and loamy marine sediments underlain by limestone. These soils are on karst uplands. Slope ranges from 0 to 5 percent. The soils are loamy, siliceous, thermic Arenic Hapludalfs.

Shadeville soils are geographically associated with Bushnell, Jonesville, Levyville, Lutterloh, Mabel, Moriah, Otela, Pedro, Seaboard, and Tavares soils. Bushnell, Lutterloh, Mabel, and Moriah soils are somewhat poorly drained. Bushnell and Mabel soils have a clayey argillic horizon within a depth of 20 inches. Bushnell soils have limestone bedrock within a depth of 40 inches. Jonesville soils have limestone bedrock at a depth of 24 to 40 inches. Levyville and Pedro soils have an argillic horizon within a depth of 20 inches. Pedro and Seaboard soils have limestone bedrock within a depth of 20 inches. Lutterloh and Otela soils have a sandy epipedon that is more than 40 inches thick. Seaboard and Tavares soils are sandy throughout.

Typical pedon of Shadeville fine sand, in an area of Shadeville-Otela complex, 1 to 5 percent slopes; approximately 1,300 feet west and 75 feet north of the southeast corner of sec. 27, T. 11 S., R. 15 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sand; weak fine granular structure; very friable; about 3 percent smooth, rounded gravel-sized ironstone nodules; strongly acid; abrupt smooth boundary.

E1—8 to 27 inches; dark yellowish brown (10YR 4/6) fine sand; single grained; loose; about 2 percent smooth, rounded gravel-sized ironstone nodules; strongly acid; clear wavy boundary.

E2—27 to 35 inches; yellow (10YR 7/6) fine sand; single grained; loose; about 2 percent smooth, rounded gravel-sized ironstone nodules; strongly acid; clear wavy boundary.

Bt—35 to 60 inches; strong brown (7.5YR 5/8) fine sandy loam; moderate medium subangular blocky structure; friable; strongly acid; clear wavy boundary.

Btg—60 to 64 inches; light gray (10YR 7/2) fine sandy loam; common medium distinct brownish yellow (10YR 6/8) mottles; massive; friable; moderately acid; abrupt wavy boundary.

2R—64 inches; white (10YR 8/1) limestone bedrock that can be dug with light power machinery.

The thickness of the solum and the depth to limestone bedrock range from 40 to 72 inches. Reaction ranges from very strongly acid to neutral in the A and E horizons and from very strongly acid to moderately

alkaline in the Btg horizon and the 2Btg horizon, if it occurs. In some pedons the content of gravel-, cobble-, or stone-sized limestone, chert, or ironstone fragments in the E and Bt horizons is as much as 5 percent.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. It ranges from 4 to 9 inches in thickness.

The E horizon has hue of 10YR, value of 4 to 8, and chroma of 2 to 6 or value of 4 or 5 and chroma of 3 to 6. In some pedons it has mottles in shades of brown or yellow. The combined thickness of the A and E horizons ranges from 20 to 39 inches.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 4 to 8 or value of 4 and chroma of 6. In some pedons it has mottles in shades of brown, yellow, or red. Many pedons have mottles in shades of gray at a depth of more than 30 inches. The Bt horizon is fine sandy loam or sandy clay loam. It ranges from 6 to 51 inches in thickness.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In some pedons it has mottles in shades of red, brown, or yellow. It is fine sandy loam, sandy clay loam, or sandy clay. It is less than 30 inches thick.

In some pedons a 2Cr horizon is above the 2R horizon. The 2Cr horizon has hue of 10YR, value of 7 or 8, and chroma of 1. It is soft, powdery limestone that can be dug with a spade. It commonly has few to many gravel- and cobble-sized fragments of hard limestone or chert.

Smyrna Series

The Smyrna series consists of very deep, poorly drained soils that formed in sandy sediments. These soils are on flatwoods. Slope ranges from 0 to 2 percent. The soils are sandy, siliceous, hyperthermic Aeric Haplaquods.

Smyrna soils are geographically associated with Adamsville, Cassia, EauGallie, Immokalee, Myakka, Placid, Pomona, Pompano, Popash, Wauchula, and Zolfo soils. Adamsville, Cassia, and Zolfo soils are somewhat poorly drained and are in the higher landscape positions. Zolfo soils do not have a spodic horizon within a depth of 50 inches. Adamsville and Pompano soils do not have a spodic horizon. EauGallie, Pomona, and Wauchula soils have a loamy argillic horizon underlying the spodic horizon. Placid and Popash soils are in the lower landscape positions, are very poorly drained, do not have an argillic horizon, and have an umbric epipedon. Immokalee and Myakka soils do not have a spodic horizon within a depth of 20 inches.

Typical pedon of Smyrna fine sand, approximately 2,200 feet north and 4,300 feet east of the southwest corner of sec. 5, T. 14 S., R. 17 E.

A—0 to 5 inches; dark brown (10YR 4/1) fine sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.

E1—5 to 9 inches; gray (10YR 5/1) fine sand; single grained; loose; many fine roots; extremely acid; clear wavy boundary.

E2—9 to 19 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; common fine roots; strongly acid; abrupt smooth boundary.

Bh—19 to 23 inches; black (10YR 2/1) fine sand; massive; friable; few fine roots; extremely acid; abrupt wavy boundary.

BC/Bh—23 to 28 inches; dark yellowish brown (10YR 4/4) fine sand (BC); very dark grayish brown (10YR 3/2) fine sand (Bh); single grained in the BC part; loose; massive in the Bh part; friable; few fine roots; very strongly acid; clear wavy boundary.

C1—28 to 57 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; very strongly acid; gradual wavy boundary.

C2—57 to 80 inches; white (10YR 8/1) fine sand; single grained; loose; strongly acid.

The solum ranges from 25 to more than 80 inches in thickness. Reaction ranges from extremely acid to neutral in the A, E, and Bh horizons and is very strongly acid or strongly acid in the underlying horizons.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 to 4 and chroma of 0 to 2. It ranges from 2 to 10 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. In some pedons it has mottles in shades of brown. It is sand or fine sand. It ranges from 2 to 16 inches in thickness. The combined thickness of the A and E horizons is less than 20 inches.

The Bh horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 3. It has hue of 5YR, value of 3, and chroma of 4. In some pedons it has mottles in shades of brown or gray. It is sand, fine sand, or loamy fine sand. It ranges from 4 to 30 inches.

Some pedons have a BC or a BC/Bh horizon underlying the Bh horizon. The BC horizon or the BC part of the BC/Bh horizon has hue of 10YR to 5YR, value of 3 to 5, and chroma of 3 or 4. The Bh part of the BC/Bh horizon consists of organically coated pockets or splotches that have colors similar to those of the Bh horizon. The texture of these horizons is sand or fine sand.

The C horizon, if it occurs, has hue of 10YR, value of 4 to 8, and chroma of 1 or 2 or value of 6 to 8 and chroma of 3 or 4. It has mottles in shades of gray, brown, or yellow. It is sand or fine sand.

Some pedons have an E′ and a B′h horizon underlying the Bh horizon.

Sparr Series

The Sparr series consists of very deep, somewhat poorly drained soils that formed in sandy and loamy marine sediments. These soils are on low uplands and on low knolls and ridges on flatwoods. Slope ranges from 0 to 5 percent. The soils are loamy, siliceous, hyperthermic Grossarenic Paleudults.

Sparr soils are geographically associated with Adamsville, Ft. Green, Hicoria, Holopaw, Lochloosa, Millhopper, Placid, Popash, Tavares, and Zolfo soils. Adamsville, Placid, Tavares, and Zolfo soils do not have an argillic horizon. Zolfo soils have a spodic horizon. Ft. Green and Lochloosa soils have a loamy argillic horizon at a depth of 20 to 40 inches. Ft. Green and Holopaw soils are poorly drained. Holopaw soils are in the lower landscape positions. Hicoria, Placid, and Popash soils are in depressions and are very poorly drained. Hicoria soils have a loamy argillic horizon at a depth of 20 to 40 inches. Millhopper and Tavares soils are moderately well drained.

Typical pedon of Sparr fine sand, approximately 1,300 feet west and 1,150 feet north of the southeast corner of sec. 19, T. 12 S., R. 17 E.

Ap—0 to 6 inches; fine sand, very dark gray (10YR 3/1) rubbed; single grained; loose; many fine and medium and common coarse roots; strongly acid; clear wavy boundary.

E1—6 to 18 inches; grayish brown (10YR 5/2) fine sand; common medium and coarse faint dark gray (10YR 4/1) old root channels; single grained; loose; common fine and medium and few coarse roots; moderately acid; gradual wavy boundary.

E2—18 to 30 inches; light gray (10YR 7/2) fine sand; single grained; loose; common fine and few medium and coarse roots; moderately acid; gradual wavy boundary.

E3—30 to 54 inches; white (10YR 8/1) fine sand; few fine distinct brownish yellow (10YR 6/6) stains; few coarse and medium distinct light brownish gray (10YR 6/2) splotches; single grained; loose; few fine and very fine and few medium roots; moderately acid; abrupt smooth boundary.

Btg—54 to 80 inches; light gray (10YR 7/1) sandy clay loam; many medium and coarse distinct brownish yellow (10YR 6/6) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; very friable, slightly sticky and slightly plastic; few fine and very fine and few medium roots; moderately acid.

The solum ranges from 65 to more than 80 inches in thickness. Reaction ranges from extremely acid to slightly acid throughout the profile. In some pedons the content of cobble- or stone-sized chert fragments on the surface or buried within the solum is as much as 2 percent.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 3 to 10 inches in thickness.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 1 to 4 or value of 4 or 5 and chroma of 2 to 4. Chroma of 1 or 2 in the upper part is the result of clean sand grains and is not indicative of wetness. Mottles are in shades of gray, brown, or yellow. The texture is sand or fine sand. Some pedons have a BE horizon that overlies the Bt or Btg horizon. The BE horizon has colors similar to those of the E horizon. It is loamy fine sand. It is less than 9 inches thick. The combined thickness of the A, E, and BE horizons ranges from 40 to 78 inches.

The Btg horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. It has mottles in shades of gray, brown, or yellow. Some pedons have a thin Bt horizon that overlies the Btg horizon. The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It has mottles in shades of gray. The texture of the Bt and Btg horizons is fine sandy loam or sandy clay loam.

The C horizon, if it occurs, is sand, fine sand, loamy sand, or loamy fine sand.

Tavares Series

The Tavares series consists of very deep, moderately well drained soils that formed in sandy marine sediments. These soils are on uplands and on low knolls and ridges on flatwoods. Slope ranges from 1 to 5 percent. The soils are hyperthermic, uncoated Typic Quartzipsamments.

Tavares soils are geographically associated with Adamsville, Apopka, Astatula, Candler, Lutterloh, Millhopper, Orlando, Otela, Shadeville, and Sparr soils. Adamsville, Lutterloh, and Sparr soils are somewhat poorly drained. Apopka, Lutterloh, Millhopper, Otela, and Sparr soils have a loamy argillic horizon at a depth of 40 to 80 inches. Apopka, Astatula, Candler, and Orlando soils are better drained than the Tavares soils and are in the slightly higher landscape positions. Candler soils have lamellae within a depth of 80 inches. Orlando soils are 5 to 10 percent silt and clay between depths of 10 and 40 inches. They have an umbric epipedon. Shadeville soils have a loamy argillic horizon within a depth of 40 inches.

Typical pedon of Tavares fine sand, 1 to 5 percent slopes, approximately 1,500 feet east and 600 feet

south of the northwest corner of sec. 4, T. 13 S., R. 17 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sand; single grained; loose; common fine and very fine and common medium roots; moderately acid; abrupt wavy boundary.

C1—7 to 24 inches; brown (10YR 5/3) fine sand; few medium and coarse faint dark grayish brown (10YR 4/2) pockets and krotovinas; single grained; loose; few fine and very fine and few medium roots; moderately acid; gradual wavy boundary.

C2—24 to 41 inches; brown (10YR 5/3) fine sand; common fine and medium prominent yellowish brown (10YR 5/8) and common medium and coarse faint pale brown (10YR 6/3) streaks and pockets; single grained; loose; few fine and very fine and few medium roots; strongly acid; gradual wavy boundary.

C3—41 to 58 inches; pale brown (10YR 6/3) fine sand; common medium distinct yellowish brown (10YR 5/8) vertical streaks; single grained; loose; few fine and very fine and few medium roots; strongly acid; diffuse wavy boundary.

C4—58 to 80 inches; white (10YR 8/2) fine sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; loose; few fine and very fine and few medium roots; strongly acid.

The soil is more than 80 inches deep over bedrock. Reaction ranges from extremely acid to moderately acid throughout.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 3 to 9 inches in thickness.

The upper part of the C horizon has hue of 10YR, value of 5, and chroma of 2 to 4 or value of 6 or 7 and chroma of 3 to 6. In many pedons it has pockets and streaks of fine sand with colors in shades of brown or sand strippings with colors in shades of gray or white. The lower part of the C horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. Mottles in shades of brown or yellow are at a depth of more than 40 inches. The texture of the C horizon is sand or fine sand.

Terra Ceia Series

The Terra Ceia series consists of very deep, very poorly drained, frequently flooded or ponded soils that formed in thick deposits of hydrophytic plant remains. These soils are in depressions on flatwoods and are on the flood plains along rivers and creeks. Slope is 0 or 1 percent. The soils are euic, hyperthermic Typic Medisaprists.

Terra Ceia soils are geographically associated with Chobee, Gator, Samsula, Placid, Popash, Tidewater, and Wulfert soils. Chobee, Placid, and Popash soils do not have a histic epipedon. Gator, Samsula, and Wulfert soils have a histic epipedon that is 16 to 51 inches thick. Tidewater soils have a histic epipedon that is less than 16 inches thick or do not have a histic epipedon.

Typical pedon of Terra Ceia muck, depressional, approximately 2,400 feet north and 2,600 feet east of the southwest corner of sec. 7, T. 12 S., R. 17 E.

Oa1—0 to 6 inches; black (N 2/0) muck; massive; nonsticky and nonplastic; 10 percent fiber unrubbed (estimated); moderately acid; clear smooth boundary.

Oa2—6 to 59 inches; very dark brown (10YR 2/2) muck; massive; nonsticky and nonplastic; 10 percent fiber unrubbed (estimated); moderately acid; clear wavy boundary.

Cg—59 to 80 inches; white (10YR 8/2) fine sand; single grained; loose; moderately acid.

The muck ranges from 51 to more than 80 inches in thickness. Reaction ranges from very strongly acid to mildly alkaline throughout the horizon.

The Oa horizon has hue of 10YR to 5YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. Fiber content is less than 30 percent unrubbed.

The C horizon, if it occurs, has hue of 10YR or 2.5Y, value of 3 to 8, and chroma of 1 or 2. The texture ranges from sand to sandy clay. Some pedons have limestone bedrock at a depth of more than 60 inches.

Tidewater Series

The Tidewater series consists of deep or very deep, very poorly drained, frequently flooded, strongly saline soils that formed in loamy and clayey marine sediments underlain by limestone. These soils are in tidal marshes. Slope is less than 1 percent. The soils are fine-loamy, siliceous, nonacid, thermic Typic Sulfaquents.

Tidewater soils are geographically associated with Boca, Cracker, Demory, Immokalee, Myakka, Wekiva, and Wulfert soils. Boca, Demory, Immokalee, Myakka, and Wekiva soils are in the higher landscape positions and are not flooded by normal high tides. Cracker soils have limestone bedrock within a depth of 20 inches. Wulfert soils have a histic epipedon that is 16 to 51 inches thick.

Typical pedon of Tidewater mucky clay, frequently flooded, in the northern half of sec. 12, T. 17 S., R. 15 E.

A1—0 to 10 inches; very dark brown (10YR 2/2) mucky clay; massive; slightly sticky and slightly plastic;

many medium roots; 3.31 percent total sulfur content; neutral; gradual smooth boundary.

A2—10 to 24 inches; black (10YR 2/1) silty clay; sticky and plastic; massive; many fine roots; 2.94 percent total sulfur content; neutral; gradual smooth boundary.

A3—24 to 40 inches; black (10YR 2/1) sandy clay loam; massive; sticky and plastic; few fine roots; 1.98 percent total sulfur content; neutral; clear smooth boundary.

2C—40 to 76 inches; black (5Y 2/1) and very dark grayish brown (10YR 4/2), mottled loamy fine sand; massive; slightly sticky and nonplastic; 0.69 percent total sulfur content; neutral; abrupt wavy boundary.

3R—76 inches; limestone bedrock that can be dug with light power machinery.

The average content of clay ranges from 18 to 35 percent between depths of 10 and 40 inches. The average silt content is less than 15 percent throughout the control section. Total sulfur content is 0.75 percent or more within 20 inches of the upper boundary of the A horizon. Reaction before drying is slightly acid or neutral throughout the profile.

The A horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. The A1 horizon ranges from 4 to 20 inches in thickness. The A2 and A3 horizons are fine sandy loam, sandy clay loam, silty clay, or the mucky analogs of those textures. Silty or clayey textures are only in the upper 20 inches of the A horizon. The total thickness of the A horizon ranges from 24 to 60 inches. Many pedons have an Oa horizon at the surface or buried at a shallow depth. This horizon has hue of 10YR or is neutral in hue. It has value of 2 and chroma of 0 to 2. It is muck. It is less than 3 inches thick.

The 2C horizon has hue of 10YR to 5BG or is neutral in hue. It has value of 2 to 5 and chroma of 0 to 2. It is most commonly sandy clay loam or fine sandy loam, but in many pedons it is sand, fine sand, or loamy fine sand at a depth of more than 40 inches. Many pedons have lenses of sandy or organic soil materials buried within the A or C horizon. In most pedons limestone bedrock is at a depth of more than 40 inches.

Waccasassa Series

The Waccasassa series consists of shallow or very shallow, poorly drained, rarely flooded soils that formed in loamy marine sediments underlain by limestone. These soils are on low ridges near the gulf coast. Slope ranges from 0 to 2 percent. The soils are loamy, siliceous, nonacid, thermic Lithic Haplaquepts.

Waccasassa soils are geographically associated with Chobee, Demory, Hallandale, Matmon, and Wekiva soils. Chobee soils are in the lower landscape positions, are very poorly drained, and are frequently flooded. They do not have limestone bedrock within a depth of 40 inches. Demory soils have a mollic epipedon. Hallandale soils do not have an argillic horizon. Matmon soils are somewhat poorly drained. Wekiva soils have a sandy epipedon that is 7 to 19 inches thick.

Typical pedon of Waccasassa sandy clay loam, in an area of Waccasassa-Demory complex, flooded; approximately 1,300 feet west and 400 feet south of the northeast corner of sec. 35, T. 14 S., R. 14 E.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) sandy clay loam; weak medium granular structure; very friable, slightly sticky and nonplastic; many fine and medium and common coarse roots; moderately acid; clear wavy boundary.

Bw—2 to 12 inches; dark yellowish brown (10YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and very fine roots; slightly acid; abrupt irregular boundary.

2R—12 inches; limestone bedrock that has an irregular surface that can be dug with light power machinery.

The thickness of the solum and the depth to limestone bedrock range from 6 to 20 inches. Reaction ranges from moderately acid to neutral within the solum. In some pedons the content of cobble- and stone-sized limestone fragments in the A and Bt horizons is as much as 5 percent. The content of gravel-sized limestone fragments is as much as 2 percent.

The A horizon has hue of 10YR or 7.5YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 3 or value of 4 and chroma of 2 or 3. When mixed to a depth of 7 inches, or to the lithic contact if it is at a depth of less than 7 inches, the value is 4 or 5 moist. Some pedons are fine sand, loamy fine sand, or fine sandy loam in the upper 3 inches. The A horizon ranges from 2 to 7 inches in thickness. Some pedons have a thin O horizon at the surface. This horizon is a mixture of leaves, roots, and mineral soil material. It has a texture that is similar to peat. It is less than 3 inches thick.

The Bw horizon has hue of 2.5Y to 7.5YR, value of 4 or 5, and chroma of 2 to 6. In many pedons it has mottles in shades of gray, brown, or yellow. It is fine sandy loam or sandy clay loam. It ranges from 3 to 18 inches in thickness.

The 2R horizon is limestone bedrock that has a smooth to irregular surface. In many pedons solution holes extend to a depth of more than 20 inches.

Wauchula Series

The Wauchula series consists of very deep, poorly drained soils that formed in sandy and loamy marine sediments. These soils are on flatwoods. Slope ranges from 0 to 2 percent. The soils are sandy, siliceous, hyperthermic Ultic Haplaquods.

Wauchula soils are geographically associated with Adamsville, Myakka, Placid, Pomona, Pompano, Popash, Smyrna, and Sparr soils. Adamsville and Sparr soils are in the slightly higher landscape positions and are somewhat poorly drained. Adamsville, Placid, Pompano, Popash, and Sparr soils do not have a spodic horizon. Adamsville, Myakka, and Smyrna soils do not have an argillic horizon. Placid and Popash soils are in depressions and are very poorly drained. Placid soils are sandy to a depth of more than 80 inches. Pomona soils do not have an argillic horizon within a depth of 40 inches. Pompano soils are sandy to a depth of more than 80 inches.

Typical pedon of Wauchula fine sand, approximately 500 feet north and 1,650 feet east of the southwest corner of sec. 4, T. 12 S., R. 16 E.

Ap—0 to 4 inches; fine sand, dark gray (10YR 4/1) rubbed; weak fine granular structure; very friable; many fine and medium and common coarse roots; extremely acid; clear irregular boundary.

E—4 to 18 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine and medium and few coarse roots; very strongly acid; abrupt wavy boundary.

Bh1—18 to 21 inches; very dark brown (10YR 2/2) fine sand; many medium and coarse distinct brown (10YR 5/3) mottles; very strongly acid; abrupt wavy boundary.

Bh2—21 to 27 inches; very dark brown (10YR 2/2) fine sand; common medium distinct dark yellowish brown (10YR 4/6) mottles; weak fine angular blocky structure; friable; few fine roots; very strongly acid; clear wavy boundary.

E′—27 to 32 inches; light yellowish brown (10YR 6/4) fine sand; common fine faint yellowish brown (10YR 5/4) mottles; single grained; loose; few fine roots; strongly acid; abrupt smooth boundary.

Btg1—32 to 47 inches; light brownish gray (10YR 6/2) sandy clay loam; many fine prominent strong brown (7.5YR 5/8) streaks around root channels; weak fine subangular blocky structure; friable; many fine and very fine roots; very strongly acid; clear irregular boundary.

Btg2—47 to 61 inches; light gray (10YR 7/2) sandy clay loam; many coarse prominent strong brown (7.5YR 5/8) and common coarse prominent red (2.5YR 4/8) mottles; weak fine subangular blocky structure; friable; many fine and very fine roots; extremely acid; clear irregular boundary.

Cg—61 to 80 inches; gray (10YR 5/1) loamy fine sand; many coarse prominent strong brown (7.5YR 5/8) mottles; few fine white (10YR 8/1) sand strippings; massive; very strongly acid.

The solum ranges from 60 to more than 80 inches in thickness. Reaction ranges from extremely acid to strongly acid in the A, E, and Bh horizons and is very strongly acid or strongly acid in the other horizons.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 to 4 and chroma of 0 to 2. It ranges from 3 to 8 inches in thickness.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It is sand or fine sand. The combined thickness of the A and E horizons ranges from 10 to 30 inches.

The Bh horizon has hue of 10YR to 5YR or is neutral in hue. It has value of 2 and chroma of 0 to 2 or value of 3 and chroma of 0 to 3. It is sand, fine sand, or loamy fine sand. It ranges from 4 to 18 inches in thickness.

The E′ horizon is below the Bh horizon. It has hue of 10YR, value of 5 to 7, and chroma of 2 or 3. It is sand or fine sand. It is less than 20 inches thick.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of brown, yellow, or red. It is sandy loam, fine sandy loam, or sandy clay loam. It ranges from 8 to 40 inches in thickness. The depth to the Btg horizon ranges from 20 to 40 inches.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1. In some pedons it has mottles in shades of brown or yellow. It is loamy fine sand or fine sand.

Wekiva Series

The Wekiva series consists of shallow to moderately deep, poorly drained soils that formed in sandy and loamy marine sediments underlain by limestone. These soils are on low ridges and flatwoods of coastal lowlands and on river flood plains along the gulf coast. Slope ranges from 0 to 2 percent. The soils are loamy, siliceous, thermic, shallow Aeric Ochraqualfs.

Wekiva soils are geographically associated with Aripeka, Boca, Chobee, Hallandale, Matmon, Pineda, and Waccasassa soils. Aripeka and Matmon soils are somewhat poorly drained and are in the slightly higher landscape positions. Chobee soils are very poorly drained, are frequently flooded, and are in the lower landscape positions. Chobee and Pineda soils do not have limestone within a depth of 40 inches. Boca and

Pineda soils have a sandy epipedon that is more than 20 inches thick. Hallandale soils do not have an argillic horizon. Waccasassa soils have loamy soil material above the bedrock.

Typical pedon of Wekiva fine sand, approximately 1,200 feet north and 200 feet west of the southeast corner of sec. 17, T. 16 S., R. 16 E.

A—0 to 4 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and medium and few coarse roots; slightly acid; clear wavy boundary.

E—4 to 9 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; many fine and medium roots; slightly acid; clear wavy boundary.

Bt—9 to 18 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; neutral; abrupt irregular boundary.

2R—18 inches; limestone bedrock that has an irregular surface that can be dug with light power machinery.

The soil is cyclic. The thickness of the solum and the depth to limestone bedrock dominantly are 10 to 20 inches but range to as much as 30 inches within a linear distance of about 12 feet. In many pedons solution holes extend to a depth of as much as 60 inches. The combined thickness of the A, E, and EB horizons ranges from 7 to 19 inches. Reaction is slightly acid or neutral throughout the profile. In many pedons the content of gravel- to stone-sized limestone fragments on the surface or within the solum is as much as 5 percent.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 0 to 2. It ranges from 2 to 7 inches in thickness.

The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is less than 12 inches thick.

Some pedons have an EB horizon that has hue of 10YR, value of 4 to 6, and chroma of 2 to 6. In some pedons this horizon has mottles in shades of gray, brown, or yellow. It is loamy fine sand or fine sand. It is less than 17 inches thick.

The Bt horizon has hue of 10YR, value of 4, and chroma of 3 or 4 or value of 5 or 6 and chroma of 3 to 8. In some pedons it has mottles in shades of gray, red, yellow, or brown. Some pedons have a Btg horizon underlying the EB or Bt horizon. The Btg horizon has hue of 10YR or is neutral in hue. It has value of 5 or 6 and chroma of 0 to 2. It has mottles in shades of gray, brown, or yellow. The texture of the Bt horizon and the Btg horizon, if it occurs, is fine sandy loam or sandy clay loam. The average content of clay throughout the Bt and Btg horizon ranges from 12 to 35 percent. The combined thickness of the Bt and Btg horizons ranges from 3 to 23 inches.

Some pedons have a Cr horizon. This horizon is at a depth of more than 20 inches or is in solution holes. It is white or very pale brown, soft, cobbly or gravelly limestone that can be dug with difficulty with a spade. It is generally less than 10 inches thick.

Wulfert Series

The Wulfert series consists of very deep, very poorly drained, frequently flooded, strongly saline soils that formed in thick deposits of hydrophytic plant remains underlain by sandy marine sediments. These soils are in areas of tidal marsh. Slope is 0 or 1 percent. The soils are sandy or sandy-skeletal, siliceous, euic, hyperthermic Terric Sulfihemists.

Wulfert soils are geographically associated with Gator, Myakka, Samsula, Terra Ceia, and Tidewater soils. Gator, Samsula, and Terra Ceia soils do not have sulfidic materials within a depth of 40 inches and are not flooded by high tides. Gator soils have loamy material that underlies the histic epipedon. Terra Ceia soils have a histic epipedon that is more than 51 inches thick. Myakka soils are poorly drained, are in the slightly higher landscape positions, and do not have an organic surface layer that is more than 3 inches thick. Tidewater soils do not have a histic epipedon and do not have sandy materials within a depth of 40 inches.

Typical pedon of Wulfert muck, frequently flooded, approximately 1,200 feet south and 1,000 feet west of the northeast corner of sec. 1, T. 14 S., R. 11 E.

Oa—0 to 30 inches; very dark brown (10YR 2/2) muck; 60 percent fiber, 15 percent rubbed (estimated); massive; nonsticky and nonplastic; many fine and very fine roots; moderately acid; gradual smooth boundary.

C1—30 to 56 inches; very dark gray (10YR 3/1) mucky loamy fine sand; common fine and medium faint dark grayish brown (10YR 4/2) pockets and streaks of fine sand; massive; slightly sticky and slightly plastic; many fine and very fine and few medium roots; neutral; gradual wavy boundary.

C2—56 to 80 inches; very dark gray (10YR 3/1) fine sand; many medium and coarse faint dark grayish brown (10YR 4/2) pockets and streaks; massive; slightly sticky and nonplastic; few fine and very fine roots; neutral.

The thickness of the organic materials and the depth to mineral soil material is 16 to 51 inches. The soil is more than 80 inches deep over bedrock.

The Oa horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. Reaction

ranges from moderately acid to neutral in 0.01 *M* $CaCl_2$ before drying. If air dried, reaction ranges from extremely acid to moderately acid. Total sulfur content in some or all of the Oa horizon is 0.75 to 2.40 percent.

The C horizon has hue of 10YR or is neutral in hue. It has value of 3 to 5 and chroma of 0 to 2. It is fine sand, loamy fine sand, or mucky loamy fine sand. Reaction before drying ranges from moderately acid to neutral.

Zolfo Series

The Zolfo series consists of very deep, somewhat poorly drained soils that formed in sandy marine sediments. These soils are mainly on low ridges and knolls that are on flatwoods. Slope ranges from 0 to 2 percent. The soils are sandy, siliceous, hyperthermic Grossarenic Entic Haplohumods.

Zolfo soils are geographically associated with Adamsville, Cassia, Immokalee, Myakka, Orsino, Placid, Pomello, Pompano, and Sparr soils. Adamsville, Orsino, and Pompano soils do not have a spodic horizon. Orsino soils are in the slightly higher landscape positions and are moderately well drained. Immokalee, Myakka, and Pompano soils are in the slightly lower landscape positions and are poorly drained. Cassia and Myakka soils have a spodic horizon at a depth of 20 to 30 inches. Immokalee and Pomello soils have a spodic horizon at a depth of 30 to 50 inches. Placid soils are in depressions and are very poorly drained. Sparr soils do not have a spodic horizon and have an argillic horizon at a depth of more than 40 inches.

Typical pedon of Zolfo sand, approximately 1,300 feet north and 300 feet east of the southwest corner of sec. 13, T. 12 S., R. 16 E.

A—0 to 4 inches; sand, very dark gray (10YR 4/1) rubbed; weak fine granular structure; very friable; moderately acid; clear irregular boundary.

E1—4 to 8 inches; pale brown (10YR 6/3) sand; single grained; loose; moderately acid; diffuse smooth boundary.

E2—8 to 32 inches; gray (10YR 6/1) sand; single grained; loose; moderately acid; diffuse smooth boundary.

E3—32 to 50 inches; light gray (10YR 7/2) sand; few fine distinct yellow (10YR 7/8) mottles; single grained; loose; slightly acid; diffuse smooth boundary.

E4—50 to 65 inches; pale brown (10YR 6/3) sand; few fine distinct brownish yellow (10YR 6/8) mottles; single grained; loose; slightly acid; diffuse smooth boundary.

E5—65 to 71 inches; light brownish gray (10YR 6/2) sand; single grained; loose; slightly acid; clear smooth boundary.

Bh—71 to 80 inches; very dark grayish brown (7.5YR 3/2) sand; weak fine granular structure; very friable; single grained; loose; slightly acid.

The solum is more than 80 inches thick. Reaction ranges from very strongly acid to neutral in the A and E horizons and from extremely acid to slightly acid in the Bh horizon.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It ranges from 2 to 9 inches in thickness.

The E horizon has hue of 10YR, value of 6 or 7, and chroma of 1 to 3. In some pedons it has mottles and streaks in shades of brown or gray. It is fine sand or sand. The combined thickness of the A and E horizons ranges from 50 to 76 inches.

The Bh horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3. It is fine sand or sand.

Formation of the Soils

In this section the factors of soil formation are related to the soils in Levy County. In addition, the processes of soil formation are described.

Factors of Soil Formation

Soil forms through weathering and other processes that act on deposited or accumulated geologic material. The kind of soil that forms depends on five major factors—the type of the parent material; the climate under which the soil material has existed since accumulation; the plant and animal life in and on the soil; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the soil material.

The five soil-forming factors are interdependent. Each modifies the effect of the others. Any one of the five factors can have more influence than the others on the formation of a soil and can account for most of its properties. For example, if the parent material is quartz sand, the soil generally has weakly expressed horizons. The effect of the parent material is significantly modified in some areas by the effects of climate, relief, and plants and animals in and on the soil. As a soil forms, it is influenced by one or more of the five factors. A modification or variation in any of the factors results in a different kind of soil.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It determines the physical, chemical, and mineral composition of a soil. In Levy County the parent material consists mostly of sandy and loamy sediments and limestones that were deposited by ocean currents. In most areas irregular, highly solutioned limestones of the Eocene age are overlain by sandy and loamy sediments of the Pleistocene age. In many areas these sediments have been reworked by relict rivers and streams, shallow ocean currents, or wind. The landscape is significantly influenced by sinkholes. The parent material on the flood plains along the major rivers and creeks and in the tidal marsh consists of alluvial sands and clays of the Holocene age.

The various kinds of parent material in Levy County differ from one another in mineral and chemical composition and in physical structure. The main physical differences, such as those between sand, silt, and clay, can be observed in the field. Other differences, such as mineral and chemical composition, are not as easily observable, but are equally important to soil formation.

Climate

The climate of Levy County is warm and humid. Extreme temperatures are moderated somewhat by the proximity to the coast.

Few of the differences in the soils in Levy County can be attributed to the climate. Climate does, however, play an important role in the formation of the soils. It aids in rapid decomposition of organic matter and hastens chemical reactions in the soil. The heavy rainfall leaches the soils of most plant nutrients and produces an acid condition in many of the sandy soils. Percolating water also carries many of the less soluble fine particles and humified organic matter downward.

Because of the climatic conditions, many of the soils in Levy County have low organic content, low natural fertility, and low available water capacity.

Plants and Animals

Plants generally are the principal biological factor affecting soil formation in Levy County. Animals, insects, bacteria, and fungi also are important. Plants and animals furnish organic matter and bring nutrients from the lower layers to the upper layers of the soil. They influence the amount of organic matter, nitrogen, and nutrients in the soil, as well as differences in soil structure and porosity. For example, some soils, such as Wulfert, Terra Ceia, and Gator soils, have upper layers that are composed almost entirely of partially decomposed plant remains.

Micro-organisms, such as bacteria and fungi, help to weather and break down minerals and to decompose organic matter. These organisms generally are most numerous in the upper few inches of the soil. Earthworms and other burrowing or tunneling organisms

mix soil material and influence its chemical composition.

Humans have influenced the formation of soils by clearing forests, cultivating and draining the soils, and introducing different kinds of plants. In many areas human activities have drastically altered the complex interactions of living organisms that affect soil formation. In many cases these activities have resulted in a general decrease in organic matter content, loss of topsoil through accelerated erosion, and some mixing of soil layers.

Relief

Relief has affected the formation of soils in Levy County mainly through its influence on soil-water relationships. Other factors of soil formation that are generally associated with relief, such as temperature and exposure, are of minor importance.

The soils of the Brooksville Ridge are generally at the highest elevations in the survey area. Consequently, they are more droughty and have been dissected and reworked by erosion to a greater extent than soils in the lower areas. The soils of the Limestone Plains are generally at the somewhat lower elevations, but the water table is below the surface of the bedrock for long enough periods to allow percolating rainwater to erode and dissolve the underlying limestone layers at an accelerated rate and to leach the upper layers of the soil. The soils of the Flatwoods and the soils of the Coastal Limestone Hammocks are at lower elevations than those of the Limestone Plains. Consequently, most of these soils are wet to the surface for significant periods, are considerably less susceptible to erosion, support more lush vegetative growth, and have a higher organic matter content in the surface layer. The soils of the Tidal Marshes and the soils on flood plains and prairies generally are at the lowest elevations in the survey area. These soils generally have water at or above the surface for significant periods, have almost no relief, and have the highest organic matter content. The rate of weathering and development in these soils is very slow. In many areas these soils are still receiving fresh deposits of alluvial sediments or undecomposed plant remains.

Time

Time is an important factor of soil formation. The physical and chemical changes brought about by climate, living organisms, and relief occur at a slow rate. The length of time needed to convert raw geologic material into soil varies, depending on the nature of the geologic material and the influence of the other factors. Some of the minerals in which soils form weather fairly rapidly, but others are chemically inert and show little evidence of change over long periods. The translocation of fine particles, which results in the formation of horizons, varies under different conditions but always takes a relatively long time.

Processes of Soil Formation

Soil genesis refers to the process involved in the formation of soil horizons, or horizon differentiation. The differentiation of most soil horizons in Levy County is a result of the accumulation of organic matter, the leaching of carbonates and colloidal organic matter, the reduction and transfer of iron and aluminum, the accumulation of silicate clay minerals, or the weathering of limestone.

Organic matter has accumulated in the upper layers of most of the soils. Some soils are composed almost entirely of organic matter in the upper layers, while other soils contain a relatively small amount of organic matter. Generally, the amount of organic matter in the soils of Levy County is directly related to the soil wetness.

In many of the soils, such as Bradenton and Bivans soils, carbonates and phosphates have been leached and have accumulated as nodules or layers at a lower depth. Because the leaching permitted the subsequent translocation of silicate clay materials in some soils, the effects have been indirect. Layers that have a significant increase in translocated silicate content of clay underlie leached sandy layers in many soils, such as Holopaw, Apopka, and Bonneau soils.

The reduction and transfer of iron and the leaching of colloidal organic matter have taken place in many of the sandy soils. Leached colloidal organic matter, iron, and aluminum accumulate as dark, weakly cemented layers in many of the wetter soils, such as Smyrna, Cassia, and EauGallie soils. Translocated ironstone nodules are in the lower layers of many other soils throughout the survey area.

The weathering of limestone layers leaves a residual layer of loamy or carbonatic soil material in many of the soils and has a significant effect on the chemical characteristics of the overlying layers.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Cyclic. Soils having intermittent horizons that extend horizontally for some distance, end, and reappear some distance away. A B horizon interrupted at intervals by upward extension of bedrock into the A horizon is an example.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depression. An area that is lower in elevation than the surrounding area and that is ponded for several months or more during most years.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess humus (in tables). Too much organic matter for intended use.

Excess salt (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sulfur (in tables). An excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The movement of water into the soil is rapid.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

Flatwoods. Broad, nearly level, low ridges characterized by an open pine forest and an understory of saw palmetto and by poorly drained soils that are dominantly sandy.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Forb. Any herbaceous plant that is not a grass or a sedge.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Green-manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of the material below the water table.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition

between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated rock (unweathered bedrock) beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the plants that are the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:
Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mounding. On sites for septic tank absorption fields or building foundations, filling with suitable soil material to the level above the water table needed to meet local and State requirements.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water

through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential climax vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of the acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs the growth of plants. A saline soil does not contain excess exchangeable sodium.

Salty water (in tables). Water is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slough. Narrow to broad, generally grassy, poorly defined drainageway that is subject to sheet flow during the rainy season.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates.

The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. See Underlying material.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). An otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Underlying material. The part of the soil below the solum.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-80 at Cross City, Florida)

Month	Temperature						Precipitation			
	Average daily maximum	Average daily minimum	Average daily	Average number of days with temperature: 90 °F or higher	Average number of days with temperature: 32 °F or lower	Average number of growing degree days*	Average	2 years in 10 will have--: Less than--	2 years in 10 will have--: More than--	Average number of days with 0.10 inch or more
	°F	°F	°F			Units	In	In	In	
January----	66.0	39.9	53.0	0	9	184	3.51	1.41	5.28	5
February---	67.9	41.8	54.9	0	6	187	3.80	1.94	5.43	5
March------	74.5	48.0	61.3	0	2	369	3.98	1.53	6.03	5
April------	80.9	54.5	67.7	1	0	538	3.03	.91	4.75	4
May--------	86.9	60.8	73.9	10	0	747	3.84	1.40	5.87	5
June-------	90.4	67.3	78.9	19	0	871	5.97	3.26	8.37	8
July-------	91.0	70.0	80.5	22	0	953	9.51	4.09	14.11	12
August-----	90.8	70.3	80.6	22	0	956	8.61	4.71	12.04	12
September--	88.8	68.3	78.6	15	0	865	6.23	2.77	9.19	8
October----	82.1	57.1	69.6	2	0	617	2.62	.77	4.11	4
November---	74.1	47.0	60.6	0	3	342	2.28	.73	3.56	3
December---	68.1	41.0	54.5	0	9	203	3.30	1.32	4.99	4
Yearly:										
Average---	80.1	55.5	67.8	---	---	---	---	---	---	---
Total-----	---	---	---	91	29	6,832	56.68	---	---	75

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-80 at Cross City, Florida)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Feb. 21	Mar. 19	Apr. 6
2 years in 10 later than--	Feb. 13	Mar. 10	Mar. 29
5 years in 10 later than--	Jan. 29	Feb. 20	Mar. 14
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 24	Nov. 5	Oct. 28
2 years in 10 earlier than--	Dec. 4	Nov. 14	Nov. 4
5 years in 10 earlier than--	Dec. 24	Dec. 2	Nov. 17

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-80 at Cross City, Florida)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	295	248	214
8 years in 10	306	260	226
5 years in 10	331	284	247
2 years in 10	365	309	269
1 year in 10	365	324	281

TABLE 4.--SUITABILITY AND LIMITATIONS OF GENERAL SOIL MAP UNITS FOR MAJOR LAND USES

Name of association and component soils	Percent of county	Percent of unit	Land capability subclass	Suitability for-- Cropland	Suitability for-- Pasture	Woodland potential productivity	Limitations for-- Septic tanks	Limitations for-- Buildings without basements
1. Candler-Astatula-Apopka	13			Poor	Poor	Low	Slight	Slight
Candler		79	IVs	Poor	Poor	Moderate	Slight	Slight
Astatula		14	VIs	Very poor	Very poor	Low	Slight	Slight
Apopka		4	IIIs	Moderate	Moderate	Moderate	Slight	Slight
Minor soils		3						
2. Orlando	1							
Orlando		91	IIIs	Moderate	Well	Moderate	Slight	Slight
Minor soils		9						
3. Otela-Candler-Tavares	13			Moderate	Well	Moderate	Moderate	Slight
Otela		47	IIIs	Moderate	Well	Moderate	Moderate: wetness, percs slowly.	Slight
Candler		16	IVs	Poor	Poor	Moderate	Slight	Slight
Tavares		13	IIIs	Moderate	Well	Moderate	Moderate: wetness.	Slight
Minor soils		24						
4. Jonesville-Pedro-Shadeville	4			Moderate	Well	Moderate	Severe	Slight
Jonesville		29	IIIs	Moderate	Well	Moderate	Severe: depth to rock, poor filter.	Slight
Pedro		26	IVs	Poor	Moderate	Moderate	Severe: depth to rock.	Moderate: depth to rock.
Shadeville		26	IIs	Well	Well	High	Moderate: depth to rock, wetness, percs slowly.	Slight
Minor soils		19						
5. Otela-Jonesville-Seaboard	3			Moderate	Well	Moderate	Severe	Slight
Otela		35	IIIs	Moderate	Well	Moderate	Moderate: depth to rock, wetness, percs slowly.	Slight
Jonesville		26	IIIs	Moderate	Well	Moderate	Severe: depth to rock, poor filter.	Slight
Seaboard		26	VIs	Poor	Moderate	Moderate	Severe: depth to rock, wetness.	Moderate: depth to rock.
Minor soils		13						

TABLE 4.--SUITABILITY AND LIMITATIONS OF GENERAL SOIL MAP UNITS FOR MAJOR LAND USES--Continued

Name of association and component soils	Percent of county	Percent of unit	Land capability subclass	Suitability for-- Cropland	Suitability for-- Pasture	Woodland potential productivity	Limitations for-- Septic tanks	Limitations for-- Buildings without basements
6. Millhopper-Bonneau	<1			Moderate	Well	High	Moderate	Slight
Millhopper		53	IIIs	Moderate	Well	High	Moderate: wetness.	Slight
Bonneau		44	IIs	Moderate	Well	High	Moderate: wetness.	Slight
Minor soils		3						
7. Sparr-Ft. Green-Bivans	<1			Moderate	Moderate	Moderate	Severe	Severe
Sparr		25	IIIw	Moderate	Well	Moderate	Severe: wetness, poor filter.	Moderate: wetness.
Ft. Green		20	IIIw	Poor	Moderate	Moderate	Severe: wetness, percs slowly.	Severe: wetness.
Bivans		13	IIIw	Poor	Moderate	High	Severe: wetness, percs slowly.	Severe: wetness, shrink-swell.
Minor soils		42						
8. Smyrna-Placid-Samsula	28			Poor	Moderate	Moderate	Severe	Severe
Smyrna		44	IVw	Poor	Moderate	Moderate	Severe: wetness, poor filter.	Severe: wetness.
Placid		18	VIIw	Unsuited	Unsuited	Unsuited	Severe: ponding, poor filter.	Severe: ponding.
Samsula		14	VIIw	Unsuited	Unsuited	Unsuited	Severe: ponding, poor filter.	Severe: ponding, low strength.
Minor soils		24						
9. Holopaw-EauGallie-Popash	8			Poor	Moderate	Moderate	Severe	Severe
Holopaw		22	IVw	Poor	Moderate	Moderate	Severe: wetness, percs slowly, poor filter.	Severe: wetness.
EauGallie		18	IVw	Poor	Moderate	Moderate	Severe: wetness, percs slowly, poor filter.	Severe: wetness.
Popash		11	VIIw	Unsuited	Unsuited	Unsuited	Severe: ponding, poor filter.	Severe: ponding.
Minor soils		49						

TABLE 4.--SUITABILITY AND LIMITATIONS OF GENERAL SOIL MAP UNITS FOR MAJOR LAND USES--Continued

Name of association and component soils	Percent of county	Percent of unit	Land capability subclass	Suitability for--: Cropland	Suitability for--: Pasture	Woodland potential productivity	Limitations for--: Septic tanks	Limitations for--: Buildings without basements
10. Orsino-Myakka-Placid	2			Poor	Moderate	Moderate	Severe	Severe
Orsino		22	IVs	Poor	Moderate	Moderate	Moderate: wetness.	Slight
Myakka		19	IVw	Poor	Moderate	Moderate	Severe: wetness, poor filter.	Severe: wetness.
Placid		12	VIIw	Unsuited	Unsuited	Unsuited	Severe: ponding, poor filter.	Severe: ponding.
Minor soils		47						
11. Cassia-Pomello-Orsino	<1			Poor	Moderate	Moderate	Severe	Moderate
Cassia		35	VIs	Poor	Moderate	Moderate	Severe: wetness.	Moderate: wetness.
Pomello		35	VIs	Poor	Moderate	Moderate	Severe: wetness, poor filter.	Moderate: wetness.
Orsino		15	IVs	Poor	Moderate	Moderate	Moderate: wetness.	Slight
Minor soils		15						
12. Wekiva-Demory-Waccasassa	15			Unsuited	Poor	Low	Severe	Severe
Wekiva		41	IVw	Poor	Moderate	Low	Severe: depth to rock, wetness.	Severe: wetness, depth to rock.
Demory		31	VIIs	Unsuited	Poor	Low	Severe: flooding, depth to rock, wetness.	Severe: flooding, wetness, depth to rock.
Waccasassa		20	VIIs	Unsuited	Poor	Low	Severe: depth to rock, wetness.	Severe: flooding, wetness, depth to rock.
Minor soils		8						

TABLE 4.--SUITABILITY AND LIMITATIONS OF GENERAL SOIL MAP UNITS FOR MAJOR LAND USES--Continued

Name of association and component soils	Percent of county	Percent of unit	Land capability subclass	Suitability for-- Cropland	Suitability for-- Pasture	Woodland potential productivity	Limitations for-- Septic tanks	Limitations for-- Buildings without basements
13. Aripeka-Matmon-Chobee	<1			Poor	Moderate	Moderate	Severe	Severe
Aripeka		31	IVw	Poor	Moderate	Moderate	Severe: depth to rock, wetness.	Severe: wetness, depth to rock.
Matmon		30	IVs	Poor	Moderate	Moderate	Severe: depth to rock, wetness.	Severe: wetness.
Chobee		15	VIIw	Unsuited	Unsuited	Unsuited	Severe: ponding, flooding, percs slowly.	Severe: ponding.
Minor soils		24						
14. Broward-Lutterloh-Zolfo	<1			Poor	Moderate	Moderate	Severe	Moderate
Broward		26	IVw	Poor	Moderate	Moderate	Severe: depth to rock, wetness, poor filter.	Moderate: wetness.
Lutterloh		26	IIIw	Poor	Moderate	Moderate	Severe: wetness.	Moderate: wetness.
Zolfo		12	IIIw	Poor	Moderate	Moderate	Severe: wetness, poor filter.	Moderate: wetness.
Minor soils		36						
15. Tidewater-Cracker	4			Unsuited	Unsuited	Unsuited	Severe	Severe
Tidewater		55	VIIIw	Unsuited	Unsuited	Unsuited	Severe: flooding, wetness.	Severe: flooding, wetness.
Cracker		35	VIIIw	Unsuited	Unsuited	Unsuited	Severe: flooding, depth to rock, wetness.	Severe: flooding, wetness, depth to rock.
Minor soils		10						
16. Tidewater-Wulfert	2			Unsuited	Unsuited	Unsuited	Severe	Severe
Tidewater		70	VIIIw	Unsuited	Unsuited	Unsuited	Severe: flooding, wetness.	Severe: flooding, wetness.
Wulfert		12	VIIIw	Unsuited	Unsuited	Unsuited	Severe: flooding, wetness, poor filter.	Severe: flooding, wetness, low strength.
Minor soils		18						

TABLE 4.--SUITABILITY AND LIMITATIONS OF GENERAL SOIL MAP UNITS FOR MAJOR LAND USES--Continued

Name of association and component soils	Percent of county	Percent of unit	Land capability subclass	Suitability for--: Cropland	Suitability for--: Pasture	Woodland potential productivity	Limitations for--: Septic tanks	Limitations for--: Buildings without basements
17. Gator-Chobee-Terre Ceia	3			Unsuited	Unsuited	Unsuited	Severe	Severe
Gator		34	VIIw	Unsuited	Unsuited	Unsuited	Severe: flooding, wetness, poor filter.	Severe: subsides, flooding, wetness.
Chobee		26	Vw	Unsuited	Poor	High	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.
Terre Ceia		16	VIIw	Unsuited	Unsuited	Unsuited	Severe: flooding, wetness, poor filter.	Severe: wetness, low strength, flooding.
Minor soils		24						
18. Hicoria-Placid-Holopaw	<1			Poor	Moderate	Moderate	Severe	Severe
Hicoria		42	IVw	Poor	Moderate	Moderate	Severe: wetness, percs slowly.	Severe: wetness.
Placid		29	IIIw	Poor	Moderate	High	Severe: wetness, poor filter.	Severe: wetness.
Holopaw		11	IVw	Poor	Moderate	Moderate	Severe: wetness, poor filter.	Severe: wetness.
Minor soils		18						

TABLE 5.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
2	Tavares fine sand, 1 to 5 percent slopes	7,529	1.0
3	Orsino fine sand, 0 to 8 percent slopes	4,772	0.6
4	Millhopper fine sand, 1 to 5 percent slopes	1,388	0.2
5	Immokalee fine sand	5,796	0.8
6	Candler fine sand, 1 to 5 percent slopes	58,986	7.8
7	Candler-Apopka complex, 1 to 5 percent slopes	7,072	0.9
8	Smyrna fine sand	66,496	8.8
9	Pomona fine sand	9,123	1.2
10	Placid fine sand	4,732	0.6
11	Placid and Samsula soils, depressional	35,779	4.8
12	Otela-Candler complex, 1 to 5 percent slopes	41,686	5.6
13	Wekiva fine sand	38,259	5.1
14	Shadeville-Otela complex, 1 to 5 percent slopes	18,360	2.4
15	Holopaw-Pineda complex, frequently flooded	3,161	0.4
16	Chobee-Gator complex, frequently flooded	7,860	1.1
17	Adamsville fine sand, 0 to 5 percent slopes	14,165	1.9
18	Wauchula fine sand	3,254	0.4
19	Sparr fine sand	4,708	0.6
21	Pompano fine sand	6,649	0.9
22	Holopaw fine sand	4,656	0.6
23	Zolfo sand	2,806	0.4
24	Terra Ceia muck, depressional	1,051	0.1
25	Pits and Dumps	1,626	0.2
26	Gator and Terra Ceia soils, frequently flooded	8,176	1.1
27	Placid and Popash soils, depressional	25,270	3.4
29	Chobee-Bradenton complex, frequently flooded	5,682	0.8
31	Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes	29,547	3.9
32	Otela-Tavares complex, 1 to 5 percent slopes	27,216	3.6
33	Wulfert muck, frequently flooded	2,739	0.4
34	Cassia-Pomello complex	5,701	0.8
35	Pineda fine sand, limestone substratum	2,169	0.3
37	Myakka mucky sand, occasionally flooded	1,355	0.2
38	Myakka sand	16,644	2.2
39	Waccasassa-Demory complex, flooded	48,940	6.5
40	Pineda fine sand	2,417	0.3
41	Demory sandy clay loam, occasionally flooded	10,403	1.4
42	Ousley-Albany complex, occasionally flooded	276	*
43	Tidewater mucky clay, frequently flooded	23,311	3.1
45	Cracker mucky clay, frequently flooded	11,574	1.5
46	Chobee fine sandy loam, limestone substratum, frequently flooded	10,610	1.4
48	Lutterloh-Moriah complex, 0 to 5 percent slopes	5,922	0.8
49	Hicoria fine sand	1,129	0.2
50	Hicoria loamy fine sand, depressional	2,931	0.4
51	Ft. Green-Bivans complex, 2 to 5 percent slopes	979	0.1
55	Pedro-Jonesville-Shadeville complex, 0 to 5 percent slopes	13,869	2.0
56	Moriah-Bushnell-Mabel, limestone substratum, complex, 0 to 5 percent slopes	4,952	0.7
57	Paola fine sand, gently rolling	1,552	0.2
58	Boca-Holopaw, limestone substratum, complex	13,287	1.8
59	Aripeka-Matmon complex	4,471	0.6
60	EauGallie-Holopaw complex, limestone substratum	13,027	1.7
62	Millhopper-Bonneau complex, 1 to 5 percent slopes	4,197	0.6
65	Sparr-Lochloosa complex, 1 to 5 percent slopes	4,991	0.7
66	Levyville-Shadeville complex, 2 to 5 percent slopes	2,506	0.3
67	Immokalee, limestone substratum-Janney complex	1,338	0.2
68	Myakka, limestone substratum-Immokalee complex	4,116	0.6
69	Broward-Lutterloh, limestone substratum, complex	2,960	0.4
70	Hallandale-Boca-Holopaw complex	3,929	0.5
71	Pender loamy fine sand	994	0.1
72	Levyville-Hague complex	233	*
73	Orlando fine sand, 1 to 5 percent slopes	7,204	1.0
74	Arents, 0 to 5 percent slopes	533	0.1
75	Orlando fine sand, 5 to 8 percent slopes	1,094	0.2
76	Astatula fine sand, 1 to 8 percent slopes	12,811	1.7

See footnote at end of table.

TABLE 5.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
77	Candler fine sand, 5 to 8 percent slopes	10,413	1.4
78	Micanopy loamy fine sand, 1 to 5 percent slopes	684	0.1
	Water areas less than 40 acres in size	1,652	0.2
	Water areas greater than 40 acres in size	45,760	6.1
	Total	749,478	100.0

* Less than 0.1 percent.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Bahiagrass	Sorghum silage	Improved bermuda-grass	Tobacco	Watermelons
		Bu	AUM*	Tons	AUM*	Lbs	Tons
2--------------- Tavares	IIIs	30	8.0	9.0	8.0	1,700	9.5
3--------------- Orsino	VIs	---	5.0	---	---	1,600	8.0
4--------------- Millhopper	IIIs	40	8.5	9.0	9.0	1,750	10.0
5--------------- Immokalee	IVw	---	7.5	8.0	---	---	9.5
6--------------- Candler	IVs	25	5.5	8.0	5.5	1,400	8.5
7:		30	6.0	9.0	6.5	1,400	9.5
Candler---------	IVs						
Apopka----------	IIIs						
8--------------- Smyrna	IVw	---	7.5	8.0	---	---	9.5
9--------------- Pomona	IVw	---	7.5	8.0	---	---	9.5
10-------------- Placid	IIIw	---	9.0	9.0	---	---	9.5
11-------------- Placid and Samsula	VIIw	---	---	---	---	---	---
12:		35	7.5	9.0	8.0	1,900	9.5
Otela-----------	IIIs						
Candler---------	IVs						
13-------------- Wekiva	IVw	---	6.5	---	---	---	---
14:		30	8.0	10	9.5	2,300	10.0
Shadeville------	IIs						
Otela-----------	IIIs						
15:		---	7.5	---	---	---	---
Holopaw---------	VIw						
Pineda----------	Vw						
16:		---	---	---	---	---	---
Chobee----------	Vw						
Gator-----------	VIIw						

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Bahiagrass	Sorghum silage	Improved bermuda-grass	Tobacco	Watermelons
		Bu	AUM*	Tons	AUM*	Lbs	Tons
17-------------- Adamsville	IIIw	35	8.5	8.5	8.5	1,700	9.5
18-------------- Wauchula	IIIw	---	9.0	8.5	---	---	9.5
19-------------- Sparr	IIIw	40	9.0	9.5	9.0	1,700	10.0
21-------------- Pompano	IVw	---	8.0	---	---	---	---
22-------------- Holopaw	IVw	---	8.0	---	---	---	---
23-------------- Zolfo	IIIw	35	8.5	8.0	8.5	---	9.0
24-------------- Terra Ceia	VIIw	---	---	---	---	---	---
25-------------- Pits and Dumps	---	---	---	---	---	---	---
26-------------- Gator and Terra Ceia	VIIw	---	---	---	---	---	---
27-------------- Placid and Popash	VIIw	---	---	---	---	---	---
29-------------- Chobee-Bradenton	Vw	---	---	---	---	---	---
31:		40	7.5	9.0	8.0	1,900	10.0
Jonesville-----	IIIs						
Otela----------	IIIs						
Seaboard-------	VIs						
32-------------- Otela-Tavares	IIIs	35	8.0	9.5	8.0	1,800	10.0
33-------------- Wulfert	VIIIw	---	---	---	---	---	---
34-------------- Cassia-Pomello	VIs	---	5.0	7.5	---	---	8.0
35-------------- Pineda	IIIw	---	---	---	---	---	---
37-------------- Myakka	Vw	---	---	---	---	---	---
38-------------- Myakka	IVw	---	7.5	8.0	---	---	9.5

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Bahiagrass	Sorghum silage	Improved bermuda-grass	Tobacco	Watermelons
		Bu	AUM*	Tons	AUM*	Lbs	Tons
39: Waccasassa-Demory	VIIs	4.0	---	---	---	---	---
40: Pineda	IIIw	---	---	---	---	---	---
41: Demory	VIIs	---	---	---	---	---	---
42: Ousley-Albany	IIIw	---	---	---	---	---	---
43: Tidewater	VIIIw	---	---	---	---	---	---
45: Cracker	VIIIw	---	---	---	---	---	---
46: Chobee	VIIw	---	---	---	---	---	---
48: Lutterloh-Moriah	IIIe	45	9.0	10.0	9.5	1,700	11.0
49: Hicoria	IVw	---	8.5	---	---	---	9.5
50: Hicoria	VIIw	---	---	---	---	---	---
51: Ft. Green-Bivans	IIIw	35	9.5	10.0	10.0	---	10.0
55:		40	8.5	10.0	8.5	1,900	10.0
Pedro	IVs						
Jonesville	IIIs						
Shadeville	IIs						
56: Moriah-Bushnell-Mabel	IIIw	55	9.5	10.0	10.0	1,900	12.0
57: Paola	VIs	---	4.0	---	---	---	7.5
58:		---	---	---	---	---	---
Boca	IIIw						
Holopaw	IVw						
59:		---	8.0	9.0	---	---	---
Aripeka	IVw						
Matmon	IVs						

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Bahiagrass	Sorghum silage	Improved bermuda-grass	Tobacco	Watermelons
		Bu	AUM*	Tons	AUM*	Lbs	Tons
60--------------- EauGallie-Holopaw	IVw	50	7.5	8.0	---	---	---
62:		40	8.5	9.0	8.0	1,900	10.0
Millhopper-----	IIIs						
Bonneau---------	IIs						
65:		40	9.0	10.0	9.5	1,700	11.0
Sparr----------	IIIw						
Lochloosa------	IIw						
66:		70	9.5	12.0	9.0	3,000	13.0
Levyville------	IIe						
Shadeville-----	IIs						
67--------------- Immokalee-Janney	IVw	---	7.5	8.0	---	---	---
68--------------- Myakka-Immokalee	IVw	---	7.5	8.0	---	---	---
69:		---	---	---	---	---	9.0
Broward--------	IVw						
Lutterloh------	IIIw						
70:		---	---	---	---	---	---
Hallandale-----	IVw						
Boca-----------	IIIw						
Holopaw--------	IVw						
71--------------- Pender	IIw	65	10.0	10.0	10.0	2,000	12.0
72:		70	9.5	12.0	9.8	3,000	13.0
Levyville------	I						
Hague----------	IIs						
73--------------- Orlando	IIIs	40	9.0	10.0	8.5	2,300	11.0
74--------------- Arents	VIs	---	---	---	---	---	---
75--------------- Orlando	IVs	40	8.0	10.0	8.5	2,200	10.0
76--------------- Astatula	VIs	---	4.0	---	4.0	---	7.5

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Bahiagrass	Sorghum silage	Improved bermuda-grass	Tobacco	Watermelons
		Bu	AUM*	Tons	AUM*	Lbs	Tons
77-------------- Candler	VIs	---	5.0	7.5	5.0	---	8.0
78-------------- Micanopy	IIw	60	10.0	10.0	10.0	2,000	12.0

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that inf
available)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	
2------------------ Tavares	10S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slas
							Longleaf pine-------	70	6	
							Turkey oak----------	---	---	
							Bluejack oak--------	---	---	
							Sand live oak-------	---	---	
3------------------ Orsino	8S	Slight	Moderate	Severe	Slight	Moderate	Slash pine----------	70	8	Slas
							Longleaf pine-------	60	4	
							Sand pine-----------	70	4	
							Sand live oak-------	---	---	
							Turkey oak----------	---	---	
4------------------ Millhopper	10S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slas
							Longleaf pine-------	65	5	
							Turkey oak----------	---	---	
							Sand live oak-------	---	---	
							Bluejack oak--------	---	---	
5------------------ Immokalee	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine----------	70	8	Slas
							Longleaf pine-------	65	5	
6------------------ Candler	8S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	70	8	Sand
							Longleaf pine-------	60	4	
							Sand pine-----------	75	4	
							Turkey oak----------	---	---	
							Sand live oak-------	---	---	
							Bluejack oak--------	---	---	
7:										
Candler-----------	8S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	70	8	Sand
							Longleaf pine-------	60	4	
							Turkey oak----------	---	---	
							Sand live oak-------	---	---	
							Bluejack oak--------	---	---	
Apopka------------	10S	Slight	Moderate	Moderate	Slight	Slight	Slash pine----------	80	10	Slas
							Longleaf pine-------	70	6	
							Turkey oak----------	---	---	
							Bluejack oak--------	---	---	
							Post oak------------	---	---	
							Live oak------------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	
8---------------- Smyrna	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slas
							Longleaf pine-------	70	6	
9---------------- Pomona	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slas
							Loblolly pine-------	80	8	
							Longleaf pine-------	70	6	
10--------------- Placid	11W	Slight	Severe	Severe	Slight	Severe	Slash pine----------	90	11	Slas
							Loblolly pine-------	90	11	
							Sweetgum------------	---	---	
11:										
Placid-----------	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress---------	75	2	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
							Sweetgum------------	---	---	
							Cabbage-palm--------	---	---	
Samsula----------	2W	Slight	Severe	Severe	Severe	Severe	Pondcypress---------	75	2	
							Sweetbay------------	---	---	
12:										
Otela------------	10S	Slight	Moderate	Severe	Slight	Moderate	Slash pine----------	80	10	Slas
							Longleaf pine-------	80	7	pin
							Loblolly pine-------	70	6	
							Live oak------------	---	---	
							Black cherry--------	---	---	
							Southern redcedar---	---	---	
							Turkey oak----------	---	---	
Candler----------	8S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	70	8	Sand
							Longleaf pine-------	60	4	
							Turkey oak----------	---	---	
							Live oak------------	---	---	
13--------------- Wekiva	8W	Slight	Severe	Severe	Severe	Severe	Slash pine----------	65	8	Slash
							Loblolly pine-------	65	6	
							Laurel oak----------	---	---	
							Southern redcedar---	---	---	
							Sweetgum------------	---	---	
							Magnolia------------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	
14:										
Shadeville	11S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	85	11	Slas
							Longleaf pine	65	5	
							Live oak	---	---	
							Laurel oak	---	---	
							Magnolia	---	---	
							Southern redcedar	---	---	
Otela	10S	Slight	Moderate	Severe	Slight	Moderate	Slash pine	80	10	Slas
							Longleaf pine	80	7	
							Live oak	---	---	
							Laurel oak	---	---	
							Magnolia	---	---	
15:										
Holopaw	10W	Slight	Severe	Severe	Slight	Severe	Slash pine	80	10	Slas
							Loblolly pine	70	6	
							Sweetgum	---	---	
							Red maple	---	---	
							Baldcypress	---	---	
							Basswood	---	---	
Pineda	10W	Slight	Severe	Severe	Slight	Severe	Slash pine	80	10	Slas
							Laurel oak	---	---	
							Water oak	---	---	
							Loblolly pine	80	8	
							Sweetgum	---	---	
							Red maple	---	---	
							Baldcypress	---	---	
							Basswood	---	---	
16:										
Chobee	6W	Slight	Severe	Moderate	Slight	Severe	Baldcypress	100	6	
							Red maple	---	---	
							Sweetgum	---	---	
							Sweetbay	---	---	
Gator	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress	100	6	
							Red maple	---	---	
							Cabbage-palm	---	---	
							Pondcypress	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	
17------------------ Adamsville	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slas
							Longleaf pine-------	65	5	lon
							Laurel oak----------	---	---	
							Live oak------------	---	---	
18------------------ Wauchula	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slas
							Longleaf pine-------	65	5	
19------------------ Sparr	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slas
							Longleaf pine-------	70	6	
							Laurel oak----------	---	---	
							Live oak------------	---	---	
21------------------ Pompano	8W	Slight	Severe	Severe	Slight	Moderate	Slash pine----------	70	8	Slas
22------------------ Holopaw	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine----------	80	10	Slas
							Longleaf pine-------	70	6	
							Cabbage-palm--------	---	---	
23------------------ Zolfo	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slas
							Longleaf pine-------	65	5	
							Turkey oak----------	---	---	
							Laurel oak----------	---	---	
							Live oak------------	---	---	
24------------------ Terra Ceia	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress---------	100	6	
							Cypress-------------	---	---	
							Sweetgum------------	---	---	
							Cabbage-palm--------	---	---	
							Sweetbay------------	---	---	
							Red maple-----------	---	---	
							Florida willow------	---	---	
26:										
Gator---------------	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress---------	100	6	
							Red maple-----------	---	---	
							Cabbage-palm--------	---	---	
							Pondcypress---------	---	---	
							Sweetbay------------	---	---	
							Sweetgum------------	---	---	
							Florida willow------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	
26:										
Terra Ceia	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress	100	6	
							Red maple	---	---	
							Pondcypress	---	---	
							Sweetbay	---	---	
							Sweetgum	---	---	
							Florida willow	---	---	
27:										
Placid	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress	75	2	
							Baldcypress	---	---	
							Red maple	---	---	
							Sweetbay	---	---	
							Florida willow	---	---	
Popash	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress	75	2	
							Baldcypress	---	---	
							Red maple	---	---	
							Sweetbay	---	---	
							Florida willow	---	---	
29:										
Chobee	6W	Slight	Severe	Moderate	Slight	Severe	Baldcypress	100	6	Slas
							Red maple	---	---	lob
							Sweetgum	---	---	
							Slash pine	90	11	
							Water oak	---	---	
Bradenton	11W	Slight	Severe	Severe	Slight	Moderate	Slash pine	90	11	Slas
							Loblolly pine	75	6	lob
							Cabbage-palm	---	---	
							Sweetgum	---	---	
							Water oak	---	---	
							Laurel oak	---	---	
							Red maple	---	---	
							Basswood	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	
31:										
Jonesville	10S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slas
							Longleaf pine	65	5	
							Laurel oak	---	---	
							Live oak	---	---	
							Southern redcedar	---	---	
							Magnolia	---	---	
Otela	10S	Slight	Moderate	Severe	Slight	Moderate	Slash pine	80	10	Slas
							Longleaf pine	80	7	
							Loblolly pine	70	6	
							Live oak	---	---	
							Southern redcedar	---	---	
							Laurel oak	---	---	
Seaboard	10S	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine	80	10	Slas lob
							Laurel oak	---	---	
							Live oak	---	---	
							Southern redcedar	---	---	
							Magnolia	---	---	
32:										
Otela	10S	Slight	Moderate	Severe	Slight	Moderate	Slash pine	80	10	Slas
							Longleaf pine	80	7	
							Loblolly pine	70	6	
							Live oak	---	---	
							Laurel oak	---	---	
							Magnolia	---	---	
Tavares	10S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slas
							Longleaf pine	70	6	
							Bluejack oak	---	---	
							Live oak	---	---	
							Laurel oak	---	---	
34:										
Cassia	8S	Slight	Moderate	Severe	Slight	Moderate	Slash pine	70	8	Slas
							Longleaf pine	60	4	
							Live oak	---	---	
Pomello	8S	Slight	Moderate	Severe	Moderate	Moderate	Slash pine	70	8	Slas
							Longleaf pine	60	4	
							Live oak	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	
35----------------- Pineda	10W	Slight	Severe	Severe	Moderate	Severe	Slash pine---------- Loblolly pine------- Sweetgum------------	80 80 ---	10 10 ---	Sout pin
37----------------- Myakka	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine---------- Loblolly pine------- Water oak----------- Laurel oak---------- Sweetbay------------ Southern redcedar--- Sweetgum------------ Red maple-----------	65 60 --- --- --- --- --- ---	8 4 --- --- --- --- --- ---	Slas
38----------------- Myakka	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine---------- Longleaf pine-------	70 60	8 4	Slas lon
39:										
Waccasassa---------	6D	Slight	Severe	Severe	Severe	Severe	Slash pine---------- Loblolly pine------- Southern redcedar--- Sweetgum------------ Laurel oak---------- Water oak----------- Blackgum------------ Basswood------------ Red maple-----------	50 50 --- --- --- --- --- --- ---	6 5 --- --- --- --- --- --- ---	Lobl pin
Demory-------------	6D	Slight	Severe	Severe	Severe	Severe	Slash pine---------- Loblolly pine------- Laurel oak---------- Water oak----------- Southern redcedar--- Sweetgum------------ Blackgum------------ Basswood------------ Red maple-----------	45 45 --- --- --- --- --- --- ---	6 5 --- --- --- --- --- --- ---	Lobl pin
40----------------- Pineda	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine---------- Cabbage-palm--------	80 ---	10 ---	Slas

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	
41----------------- Demory	6D	Slight	Severe	Severe	Severe	Severe	Slash pine----------	45	6	Lobl pin
							Loblolly pine-------	45	5	
							Laurel oak----------	---	---	
							Water oak-----------	---	---	
							Southern redcedar---	---	---	
							Sweetgum------------	---	---	
							Blackgum------------	---	---	
							Basswood------------	---	---	
							Red maple-----------	---	---	
42:										
Ousley------------	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slas pin
							Loblolly pine-------	80	8	
							Laurel oak----------	---	---	
							Water oak-----------	---	---	
							Water hickory-------	---	---	
							Sweetgum------------	---	---	
Albany------------	11W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	85	11	Slas pin
							Loblolly pine-------	95	9	
							Laurel oak----------	---	---	
							Water oak-----------	---	---	
							Water hickory-------	---	---	
							Sweetgum------------	---	---	
46----------------- Chobee	2W	Slight	Severe	Severe	Moderate	Moderate	Pondcypress---------	75	2	
							Baldcypress---------	---	---	
							Cabbage-palm--------	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
							Sweetgum------------	---	---	
							Florida willow------	---	---	
48:										
Lutterloh---------	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slas pin
							Loblolly pine-------	80	8	
							Longleaf pine-------	65	5	
							Laurel oak----------	---	---	
							Live oak------------	---	---	
							Southern redcedar---	---	---	
							Southern magnolia---	---	---	
							Sweetgum------------	---	---	
							Hickory-------------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	
48:										
Moriah	11S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	85	11	Slas
							Loblolly pine	---	---	pin
							Live oak	---	---	
							Laurel oak	---	---	
							Hickory	---	---	
							Sweetgum	---	---	
							Southern redcedar	---	---	
							Southern magnolia	---	---	
							Sweetgum	---	---	
49 Hicoria	10W	Slight	Severe	Severe	Slight	Severe	Slash pine	80	10	Slas
							Cabbage-palm	---	---	
50 Hicoria	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress	75	2	
							Baldcypress	---	---	
							Blackgum	---	---	
							Red maple	---	---	
							Sweetbay	---	---	
51:										
Ft. Green	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine	80	10	Slas
							Loblolly pine	65	5	
							Cabbage-palm	---	---	
							Laurel oak	---	---	
							Live oak	---	---	
							Magnolia	---	---	
							Sweetgum	---	---	
							Hickory	---	---	
							Eastern redcedar	---	---	
Bivans	11W	Slight	Moderate	Slight	Slight	Severe	Slash pine	90	11	Slas
							Loblolly pine	90	9	pin
							Sweetgum	---	---	
							Hickory	---	---	
							Magnolia	---	---	
							Live oak	---	---	
							Laurel oak	---	---	
							American holly	---	---	
							Eastern redcedar	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	
55:										
Pedro	10S	Slight	Moderate	Moderate	Moderate	Slight	Slash pine	80	10	Slas
							Loblolly pine	80	8	pin
							Longleaf pine	70	6	
							Live oak	---	---	
							Laurel oak	---	---	
							Magnolia	---	---	
							Eastern redcedar	---	---	
							Sweetgum	---	---	
Jonesville	10S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slas
							Longleaf pine	65	5	pin
							Laurel oak	---	---	
							Live oak	---	---	
							Hickory	---	---	
							Eastern redcedar	---	---	
							Magnolia	---	---	
							Sweetgum	---	---	
Shadeville	11S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	85	11	Slas
							Loblolly pine	90	9	pin
							Longleaf pine	65	5	
							Live oak	---	---	
							Laurel oak	---	---	
							Magnolia	---	---	
56:										
Moriah	11S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	85	11	Slas
							Loblolly pine	---	---	pin
							Live oak	---	---	
							Laurel oak	---	---	
							Hickory	---	---	
							Sweetgum	---	---	
							Southern redcedar	---	---	
							Southern magnolia	---	---	
Bushnell	11W	Slight	Moderate	Slight	Slight	Moderate	Slash pine	90	11	Lobl
							Loblolly pine	90	9	pin
							Southern redcedar	---	---	
							Laurel oak	---	---	
							Live oak	---	---	
							Sweetgum	---	---	
							Magnolia	---	---	
							Water oak	---	---	
							Cabbage-palm	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	T
56:										
Mabel-------------	11W	Slight	Moderate	Slight	Slight	Moderate	Slash pine----------	90	11	Slas pin
							Loblolly pine-------	90	9	
							Southern redcedar---	---	---	
							Laurel oak----------	---	---	
							Live oak------------	---	---	
							Sweetgum------------	---	---	
							Southern magnolia---	---	---	
							Water oak-----------	---	---	
57----------------- Paola	2S	Slight	Moderate	Severe	Slight	Slight	Sand pine-----------	50	2	Sand
							Sand live oak-------	---	---	
							Longleaf pine-------	45	2	
							Turkey oak----------	---	---	
58:										
Boca--------------	8W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	70	8	Slas
							Loblolly pine-------	70	8	
							Laurel oak----------	---	---	
							Sweetgum------------	---	---	
							Cabbage-palm--------	---	---	
Holopaw-----------	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine----------	80	10	Slas
							Cabbage-palm--------	---	---	
							Laurel oak----------	---	---	
							Sweetgum------------	---	---	
59:										
Aripeka-----------	10W	Slight	Slight	Moderate	Moderate	Moderate	Slash pine----------	80	10	Slas pin
							Loblolly pine-------	80	8	
							Laurel oak----------	---	---	
							Water oak-----------	---	---	
							Southern redcedar---	---	---	
							Southern magnolia---	---	---	
							Sweetgum------------	---	---	
							Cabbage-palm--------	---	---	
Matmon------------	9W	Slight	Moderate	Moderate	Severe	Moderate	Slash pine----------	75	9	Lobl pin
							Loblolly pine-------	75	7	
							Live oak------------	---	---	
							Laurel oak----------	---	---	
							Southern redcedar---	---	---	
							Magnolia------------	---	---	
							Sweetgum------------	---	---	
							Cabbage-palm--------	---	---	
60:										
EauGallie---------	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slas
							Cabbage-palm--------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	
60:										
Holopaw	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine	80	10	Slas
							Cabbage-palm	---	--	
62:										
Millhopper	10S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slas
							Loblolly pine	80	8	
							Longleaf pine	65	5	
							Live oak	---	---	
							Laurel oak	---	---	
							Turkey oak	---	---	
							Magnolia	---	---	
Bonneau	11S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	90	11	Slas
							Loblolly pine	90	9	pin
							Longleaf pine	75	6	
							Turkey oak	---	---	
							Magnolia	---	---	
							Live oak	---	---	
							Laurel oak	---	---	
65:										
Sparr	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slas
							Loblolly pine	80	8	
							Longleaf pine	70	6	
							Laurel oak	---	---	
							Live oak	---	---	
							Dogwood	---	---	
							Magnolia	---	---	
							Hickory	---	---	
Lochloosa	11A	Slight	Slight	Slight	Slight	Slight	Slash pine	90	11	Slas
							Loblolly pine	90	9	pin
							Dogwood	---	---	
							Hickory	---	---	
							Live oak	---	---	
							Laurel oak	---	---	
							Magnolia	---	---	
							Sweetgum	---	---	
							Eastern redcedar	---	---	
66:										
Levyville	11A	Slight	Slight	Slight	Slight	Moderate	Slash pine	90	11	Slas
							Loblolly pine	80	8	pin
							Longleaf pine	---	---	
							Laurel oak	---	---	
							Live oak	---	---	
							Magnolia	---	---	
							Southern redcedar	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	
66:										
Shadeville	11S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	85	11	Slas
							Loblolly pine	90	9	pin
							Longleaf pine	65	5	
							Live oak	---	---	
							Magnolia	---	---	
							Southern redcedar	---	---	
67:										
Immokalee	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine	70	8	Slas
							Sweetgum	55	6	
							Cabbage-palm	---	---	
Janney	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine	70	8	Slas
							Sweetgum	---	---	
							Cabbage-palm	---	---	
68:										
Myakka	8W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	70	8	Sout
							Longleaf pine	60	4	pin
							Sweetgum	---	---	
							Cabbage-palm	---	---	
Immokalee	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine	70	8	Slas
							Longleaf pine	65	5	
							Sweetgum	---	---	
							Cabbage-palm	---	---	
69:										
Broward	9W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	75	9	Slas
							Cabbage-palm	---	---	
							Live oak	---	---	
Lutterloh	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slas
							Loblolly pine	80	8	pin
							Live oak	---	---	
70:										
Hallandale	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine	65	8	Slas
							Sweetgum	---	---	
							Laurel oak	---	---	
							Cabbage-palm	---	---	
Boca	8W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	70	8	Slas
							Sweetgum	---	---	
							Laurel oak	---	---	
							Cabbage-palm	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	
70:										
Holopaw	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine	80	10	Slas
							Loblolly pine	70	6	
							Cabbage-palm	---	---	
							Sweetgum	---	---	
							Laurel oak	---	---	
71 Pender	11W	Slight	Slight	Slight	Slight	Moderate	Slash pine	90	11	Lobl pin
							Loblolly pine	94	10	
							Longleaf pine	---	---	
							Sweetgum	---	---	
72:										
Levyville	11A	Slight	Slight	Slight	Slight	Moderate	Slash pine	90	11	Slas pin
							Loblolly pine	80	8	
							Longleaf pine	---	--	
							Laurel oak	---	--	
							Live oak	---	--	
							Magnolia	---	--	
							Southern redcedar	---	--	
Hague	11A	Slight	Slight	Slight	Slight	Slight	Slash pine	90	11	Slas
							Loblolly pine	90	9	
							Longleaf pine	80	7	
							Live oak	---	---	
							Laurel oak	---	---	
							Dogwood	---	---	
							Magnolia	---	---	
73, 75 Orlando	10S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slas
							Longleaf pine	65	5	
							Laurel oak	---	---	
							Live oak	---	---	
							Turkey oak	---	---	
							Bluejack oak	---	---	
76 Astatula	3S	Slight	Severe	Moderate	Slight	Slight	Sand pine	60	3	Sand
							Turkey oak	---	---	
							Bluejack oak	---	---	
							Longleaf pine	50	3	
							Live oak	---	---	
77 Candler	8S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	70	8	Sand
							Longleaf pine	60	4	
							Turkey oak	---	---	
							Live oak	---	---	
							Bluejack oak	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	
78: Micanopy	11A	Slight	Slight	Slight	Slight	Slight	Slash pine	90	11	Slas
							Loblolly pine	90	9	pin
							Longleaf pine	75	6	
							Magnolia	---	---	
							Hickory	---	---	
							Dogwood	---	---	
							Laurel oak	---	---	
							Live oak	---	---	
							Water oak	---	---	
							Sweetgum	---	---	
							Eastern redcedar	---	---	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination increment for fully stocked natural stands.

** Trees to plant are not given for this soil because of severe management concerns.

TABLE 8.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2: Tavares	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
3: Orsino	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
4: Millhopper	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
5: Immokalee	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
6: Candler	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
7:					
Candler	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Apopka	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
8: Smyrna	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
9: Pomona	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
10: Placid	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
11:					
Placid	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
Samsula	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
12:					
Otela	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
Candler	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
13: Wekiva	Severe: wetness, too sandy, depth to rock.	Severe: wetness, too sandy, depth to rock.	Severe: too sandy, wetness, depth to rock.	Severe: wetness, too sandy.	Severe: wetness, depth to rock.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
14:					
Shadeville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
Otela	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
15:					
Holopaw	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
Pineda	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, droughty, flooding.
16:					
Chobee	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, flooding, percs slowly.	Severe: wetness.	Severe: wetness, flooding.
Gator	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness, flooding.	Severe: wetness, excess humus.	Severe: wetness, flooding, excess humus.
17 Adamsville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
18 Wauchula	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: wetness.
19 Sparr	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty.
21 Pompano	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
22 Holopaw	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
23 Zolfo	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
24 Terra Ceia	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
25:					
Pits.					
Dumps.					

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
26:					
Gator	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness, flooding.	Severe: wetness, excess humus.	Severe: wetness, flooding, excess humus.
Terra Ceia	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness, flooding.	Severe: ponding, excess humus, wetness.	Severe: wetness, excess humus, flooding.
27:					
Placid	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
Popash	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: ponding.
29:					
Chobee	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, flooding, percs slowly.	Severe: wetness.	Severe: wetness, flooding.
Bradenton	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
31:					
Jonesville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Otela	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
Seaboard	Severe: too sandy, depth to rock.	Severe: too sandy, depth to rock.	Severe: too sandy, depth to rock.	Severe: too sandy.	Severe: depth to rock.
32:					
Otela	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
Tavares	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
33 Wulfert	Severe: wetness, excess humus, excess salt.	Severe: flooding, wetness, excess humus.	Severe: excess humus, wetness, flooding.	Severe: wetness, excess humus.	Severe: excess salt, excess sulfur, wetness.
34:					
Cassia	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty.
Pomello	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
35: Pineda	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, droughty.
37: Myakka	Severe: wetness, too sandy, flooding.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
38: Myakka	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
39:					
Waccasassa	Severe: flooding, wetness.	Severe: wetness, depth to rock.	Severe: wetness, depth to rock.	Severe: wetness.	Severe: wetness, depth to rock.
Demory	Severe: flooding, wetness.	Severe: wetness, depth to rock.	Severe: wetness, depth to rock.	Severe: wetness.	Severe: wetness, depth to rock.
40: Pineda	Severe: wetness, percs slowly, too sandy.	Severe: wetness, too sandy, percs slowly.	Severe: too sandy, wetness, percs slowly.	Severe: wetness, too sandy.	Severe: wetness, droughty.
41: Demory	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus, depth to rock.	Severe: excess humus, wetness, depth to rock.	Severe: wetness, excess humus.	Severe: wetness, depth to rock, excess humus.
42:					
Ousley	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Albany	Severe: flooding, wetness.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: droughty.
43: Tidewater	Severe: flooding, wetness, too clayey.	Severe: wetness, too clayey, excess salt.	Severe: too clayey, wetness, flooding.	Severe: wetness, too clayey.	Severe: excess salt, excess sulfur, wetness.
45: Cracker	Severe: flooding, wetness, too clayey.	Severe: wetness, too clayey, excess salt.	Severe: too clayey, wetness, flooding.	Severe: wetness, too clayey.	Severe: excess salt, wetness, flooding.
46: Chobee	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
48:					
Lutterloh	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Moriah	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
49: Hicoria	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
50: Hicoria	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
51:					
Ft. Green	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
Bivans	Severe: wetness, percs slowly, too sandy.	Severe: wetness, too sandy, percs slowly.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
55:					
Pedro	Severe: too sandy, depth to rock.	Severe: too sandy, depth to rock.	Severe: too sandy, depth to rock.	Severe: too sandy.	Severe: droughty, depth to rock.
Jonesville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Shadeville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
56:					
Moriah	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty.
Bushnell	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty, depth to rock.
Mabel	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness.
57: Paola	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
58:					
Boca	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
Holopaw	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness.
59:					
Aripeka	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty, depth to rock.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
59:					
Matmon	Severe: wetness, too sandy, depth to rock.	Severe: too sandy, depth to rock.	Severe: too sandy, wetness, depth to rock.	Severe: too sandy.	Severe: depth to rock.
60:					
EauGallie	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
Holopaw	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness.
62:					
Millhopper	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
Bonneau	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
65:					
Sparr	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty.
Lochloosa	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Slight.
66:					
Levyville	Slight	Slight	Moderate: slope.	Slight	Slight.
Shadeville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
67:					
Immokalee	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, droughty.
Janney	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
68:					
Myakka	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness.
Immokalee	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
69:					
Broward	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Lutterloh	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
70:					
Hallandale	Severe: wetness, too sandy.	Severe: wetness, too sandy, depth to rock.	Severe: too sandy, wetness, depth to rock.	Severe: wetness, too sandy.	Severe: wetness, droughty, depth to rock.
Boca	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
Holopaw	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
71 Pender	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
72:					
Levyville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Slight.
Hague	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
73 Orlando	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
74. Arents					
75 Orlando	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
76 Astatula	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
77 Candler	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
78 Micanopy	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness, droughty.

TABLE 9.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
2-----------------Tavares	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
3-----------------Orsino	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
4-----------------Millhopper	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
5-----------------Immokalee	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor	Poor	Poor.
6-----------------Candler	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
7:										
Candler-----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Apopka------------	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.
8-----------------Smyrna	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
9-----------------Pomona	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair.
10----------------Placid	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
11:										
Placid------------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Samsula-----------	Very poor.	Very poor.	Poor	Fair	Very poor.	Good	Good	Very poor.	Poor	Good.
12:										
Otela-------------	Poor	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Very poor.
Candler-----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
13----------------Wekiva	Poor	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
14:										
Shadeville--------	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Otela-------------	Poor	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Very poor.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
15:										
Holopaw	Very poor.	Very poor.	Poor	Fair	Poor	Good	Fair	Very poor.	Fair	Fair.
Pineda	Poor	Poor	Poor	Poor	Poor	Fair	Fair	Poor	Poor	Fair.
16:										
Chobee	Poor	Poor	Poor	Fair	Poor	Good	Good	Poor	Poor	Good.
Gator	Very poor.	Very poor.	Very poor.	Fair	Very poor.	Good	Good	Very poor.	Poor	Good.
17 Adamsville	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
18 Wauchula	Poor	Poor	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
19 Sparr	Poor	Fair	Good	Fair	Fair	Poor	Fair	Fair	Fair	Poor.
21 Pompano	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor	Poor	Fair.
22 Holopaw	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
23 Zolfo	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
24 Terra Ceia	Very poor.	Very poor.	Poor	Poor	Very poor.	Good	Good	Very poor.	Poor	Good.
25:										
Pits.										
Dumps.										
26:										
Gator	Very poor.	Very poor.	Very poor.	Fair	Very poor.	Good	Good	Very poor.	Poor	Good.
Terra Ceia	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
27:										
Placid	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Popash	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
29:										
Chobee	Poor	Poor	Poor	Fair	Poor	Good	Good	Poor	Poor	Good.
Bradenton	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Poor.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
31:										
Jonesville	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Otela	Poor	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Very poor.
Seaboard	Poor	Poor	Fair	Fair	Poor	Very poor.	Very poor.	Fair	Fair	Very poor.
32:										
Otela	Poor	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Very poor.
Tavares	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
33 Wulfert	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Fair	Very poor.	Very poor.	Fair.
34:										
Cassia	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
Pomello	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
35 Pineda	Poor	Fair	Fair	Poor	Poor	Good	Fair	Fair	Poor	Fair.
37 Myakka	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
38 Myakka	Poor	Fair	Fair	Poor	Poor	Fair	Poor	Fair	Poor	Poor.
39:										
Waccasassa	Very poor.	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor.
Demory	Very poor.	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor.
40 Pineda	Poor	Fair	Fair	Poor	Poor	Good	Fair	Fair	Poor	Fair.
41 Demory	Very poor.	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor.
42:										
Ousley	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
Albany	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
43 Tidewater	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
45 Cracker	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Poor	Very poor.	Very poor.	Fair.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
46------------------Chobee	Very poor.	Very poor.	Very poor.	Fair	Very poor.	Good	Good	Very poor.	Poor	Good.
48:										
Lutterloh----------	Poor	Fair	Fair	Poor	Fair	Poor	Poor	Fair	Fair	Poor.
Moriah-------------	Poor	Fair	Fair	Poor	Fair	Poor	Poor	Fair	Fair	Poor.
49------------------Hicoria	Poor	Fair	Good	Poor	Poor	Fair	Good	Fair	Fair	Fair.
50------------------Hicoria	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
51:										
Ft. Green----------	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
Bivans-------------	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
55:										
Pedro--------------	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Jonesville---------	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Shadeville---------	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
56:										
Moriah-------------	Poor	Fair	Fair	Poor	Fair	Poor	Poor	Fair	Fair	Poor.
Bushnell-----------	Fair	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Fair.
Mabel--------------	Fair	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Fair.
57------------------Paola	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
58:										
Boca---------------	Poor	Fair	Fair	Poor	Poor	Good	Fair	Fair	Poor	Fair.
Holopaw------------	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
59:										
Aripeka------------	Poor	Fair	Fair	Poor	Fair	Poor	Poor	Fair	Fair	Poor.
Matmon-------------	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor	Poor	Poor.
60:										
EauGallie----------	Poor	Poor	Poor	Poor	Poor	Poor	Very poor.	Poor	Poor	Poor.
Holopaw------------	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
62:										
Millhopper---------	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
62:										
Bonneau	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
65:										
Sparr	Poor	Fair	Good	Fair	Fair	Poor	Fair	Fair	Fair	Poor.
Lochloosa	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
66:										
Levyville	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Shadeville	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
67:										
Immokalee	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor	Poor	Poor.
Janney	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
68:										
Myakka	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor	Poor	Poor.
Immokalee	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor	Poor	Poor.
69:										
Broward	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
Lutterloh	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
70:										
Hallandale	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
Boca	Poor	Fair	Fair	Poor	Poor	Good	Fair	Fair	Poor	Fair.
Holopaw	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
71 Pender	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
72:										
Levyville	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Hague	Fair	Fair	Good	Fair	Good	Very poor.	Very poor.	Fair	Good	Very poor.
73 Orlando	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
74. Arents										
75 Orlando	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
76 Astatula	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
77----------------- Candler	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
78----------------- Micanopy	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.

TABLE 10.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2 Tavares	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
3 Orsino	Severe: cutbanks cave.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Severe: droughty.
4 Millhopper	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
5 Immokalee	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
6 Candler	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
7:						
Candler	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
Apopka	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
8 Smyrna	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
9 Pomona	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
10 Placid	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
11:						
Placid	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Samsula	Severe: cutbanks cave, excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, excess humus.
12:						
Otela	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
Candler	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
13 Wekiva	Severe: depth to rock, wetness.	Severe: wetness, depth to rock.	Severe: wetness, depth to rock.	Severe: wetness, depth to rock.	Severe: depth to rock, wetness.	Severe: wetness, depth to rock.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
14:						
Shadeville	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
Otela	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
15:						
Holopaw	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.
Pineda	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: wetness, flooding.	Severe: wetness, droughty, flooding.
16:						
Chobee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Gator	Severe: cutbanks cave, excess humus, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, wetness, flooding.	Severe: wetness, flooding, excess humus.
17 Adamsville	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
18 Wauchula	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
19 Sparr	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
21 Pompano	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
22 Holopaw	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
23 Zolfo	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
24 Terra Ceia	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: ponding, excess humus.
25:						
Pits.						
Dumps.						

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
26:						
Gator	Severe: cutbanks cave, excess humus, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, wetness, flooding.	Severe: wetness, flooding, excess humus.
Terra Ceia	Severe: excess humus, wetness.	Severe: wetness, low strength, flooding.	Severe: wetness, low strength, flooding.	Severe: wetness, low strength, flooding.	Severe: wetness, low strength, flooding.	Severe: wetness, excess humus, flooding.
27:						
Placid	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Popash	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
29:						
Chobee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Bradenton	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
31:						
Jonesville	Severe: cutbanks cave.	Slight	Moderate: depth to rock.	Slight	Slight	Severe: droughty.
Otela	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
Seaboard	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.
32:						
Otela	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
Tavares	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
33 Wulfert	Severe: cutbanks cave, excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: flooding, wetness, low strength.	Severe: low strength, wetness, flooding.	Severe: excess salt, excess sulfur, wetness.
34:						
Cassia	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Pomello	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
35-------------- Pineda	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
37-------------- Myakka	Severe: cutbanks cave, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, droughty.
38-------------- Myakka	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
39:						
Waccasassa-----	Severe: depth to rock, wetness.	Severe: flooding, wetness, depth to rock.	Severe: flooding, wetness, depth to rock.	Severe: flooding, wetness, depth to rock.	Severe: depth to rock, wetness.	Severe: wetness, depth to rock.
Demory---------	Severe: depth to rock, wetness.	Severe: flooding, wetness, depth to rock.	Severe: flooding, wetness, depth to rock.	Severe: flooding, wetness, depth to rock.	Severe: depth to rock, wetness, flooding.	Severe: wetness, depth to rock.
40-------------- Pineda	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
41-------------- Demory	Severe: depth to rock, wetness.	Severe: flooding, wetness, depth to rock.	Severe: flooding, wetness, depth to rock.	Severe: flooding, wetness, depth to rock.	Severe: depth to rock, wetness, flooding.	Severe: wetness, depth to rock, excess humus.
42:						
Ousley---------	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: droughty.
Albany---------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: droughty.
43-------------- Tidewater	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: excess salt, excess sulfur, wetness.
45-------------- Cracker	Severe: depth to rock, wetness.	Severe: flooding, wetness, depth to rock.	Severe: flooding, wetness, depth to rock.	Severe: flooding, wetness, depth to rock.	Severe: depth to rock, wetness, flooding.	Severe: excess salt, wetness, flooding.
46-------------- Chobee	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
48:						
Lutterloh------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
48:						
Moriah----------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
49-------------- Hicoria	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
50-------------- Hicoria	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
51:						
Ft. Green-------	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Bivans----------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
55:						
Pedro-----------	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock.	Severe: droughty, depth to rock.
Jonesville------	Severe: cutbanks cave.	Slight----------	Moderate: depth to rock.	Slight----------	Slight----------	Severe: droughty.
Shadeville------	Severe: cutbanks cave.	Slight----------	Moderate: wetness.	Slight----------	Slight----------	Moderate: droughty.
56:						
Moriah----------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Bushnell--------	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness, droughty, depth to rock.
Mabel-----------	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
57-------------- Paola	Severe: cutbanks cave.	Slight----------	Slight----------	Moderate: slope.	Slight----------	Severe: droughty.
58:						
Boca------------	Severe: depth to rock, cutbanks cave, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Holopaw---------	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
59:						
Aripeka	Severe: depth to rock, wetness.	Severe: wetness, depth to rock.	Moderate: wetness, depth to rock.	Moderate: wetness, depth to rock.	Moderate: depth to rock, wetness.	Moderate: wetness, droughty, depth to rock.
Matmon	Severe: depth to rock, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Severe: wetness.	Moderate: depth to rock, wetness.	Severe: depth to rock.
60:						
EauGallie	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Holopaw	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
62:						
Millhopper	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
Bonneau	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
65:						
Sparr	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Lochloosa	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Slight.
66:						
Levyville	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
Shadeville	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
67:						
Immokalee	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Janney	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
68:						
Myakka	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Immokalee	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
69:						
Broward	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
Lutterloh	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
70:						
Hallandale	Severe: depth to rock, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty, depth to rock.
Boca	Severe: depth to rock, cutbanks cave, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Holopaw	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
71 Pender	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Moderate: wetness.
72:						
Levyville	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
Hague	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
73 Orlando	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty, too sandy.
74. Arents						
75 Orlando	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty, too sandy.
76 Astatula	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
77 Candler	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
78 Micanopy	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness, droughty.

TABLE 11.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2*: Tavares	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
3*: Orsino	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
4: Millhopper	Moderate: wetness.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
5: Immokalee	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
6*: Candler	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
7*:					
Candler	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Apopka	Slight	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
8: Smyrna	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
9: Pomona	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
10: Placid	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, ponding, too sandy.	Severe: seepage, wetness.	Poor: wetness, too sandy, seepage.
11:					
Placid	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
11:					
Samsula	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
12:					
Otela	Moderate: wetness, percs slowly.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Candler*	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
13 Wekiva	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Poor: depth to rock, wetness.
14:					
Shadeville	Moderate: depth to rock, wetness, percs slowly.	Severe: seepage.	Severe: depth to rock, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Otela	Moderate: wetness, percs slowly.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
15:					
Holopaw	Severe: flooding, wetness.	Severe: seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Pineda	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
16:					
Chobee	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
Gator	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness, excess humus.
17 Adamsville	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
18 Wauchula	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
19----------------- Sparr	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
21----------------- Pompano	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
22----------------- Holopaw	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
23----------------- Zolfo	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
24----------------- Terra Ceia	Severe: subsides, ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
25: Pits.					
Dumps.					
26: Gator---------------	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness, excess humus.
Terra Ceia----------	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, wetness, excess humus.	Severe: flooding, seepage, wetness.	Poor: wetness, excess humus.
27: Placid--------------	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
Popash--------------	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
29: Chobee--------------	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
Bradenton-----------	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
31:					
Jonesville	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage, too sandy.	Severe: depth to rock, seepage.	Poor: depth to rock, seepage, too sandy.
Otela	Moderate: depth to rock, wetness, percs slowly.	Severe: seepage.	Severe: depth to rock, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Seaboard	Severe: depth to rock, wetness.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage, wetness.	Severe: depth to rock.	Poor: depth to rock, seepage, too sandy.
32:					
Otela	Moderate: wetness, percs slowly.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Tavares*	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
33 Wulfert	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, wetness, excess humus.
34:					
Cassia	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Pomello	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
35 Pineda	Severe: wetness, percs slowly, poor filter.	Severe: seepage.	Severe: depth to rock, wetness.	Severe: seepage, wetness.	Poor: wetness, thin layer.
37 Myakka	Severe: wetness, poor filter, flooding.	Severe: seepage, wetness, flooding.	Severe: seepage, wetness, flooding.	Severe: seepage, wetness, flooding.	Poor: seepage, too sandy, wetness.
38 Myakka	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
39:					
Waccasassa	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Poor: depth to rock, wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
39:					
Demory	Severe: flooding, depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: flooding, depth to rock, wetness.	Severe: flooding, depth to rock, wetness.	Poor: depth to rock, wetness.
40 Pineda	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
41 Demory	Severe: flooding, depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: flooding, depth to rock, wetness.	Severe: flooding, depth to rock, wetness.	Poor: depth to rock, wetness.
42:					
Ousley	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy.
Albany	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, too sandy.	Severe: flooding, seepage, wetness.	Poor: too sandy, wetness.
43 Tidewater	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, depth to rock, wetness.	Severe: flooding, wetness.	Poor: wetness, excess salt.
45 Cracker	Severe: flooding, depth to rock, wetness.	Severe: depth to rock, flooding.	Severe: flooding, depth to rock, wetness.	Severe: flooding, depth to rock, wetness.	Poor: depth to rock, wetness, excess salt.
46 Chobee	Severe: ponding, flooding, percs slowly.	Severe: ponding, flooding.	Severe: depth to rock, ponding, flooding.	Severe: ponding, flooding.	Poor: ponding, thin layer.
48:					
Lutterloh	Severe: wetness.	Severe: seepage.	Severe: wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Moriah	Severe: wetness, percs slowly.	Severe: wetness, seepage.	Severe: depth to rock, wetness.	Severe: seepage.	Poor: thin layer.
49 Hicoria	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness, thin layer.
50 Hicoria	Severe: ponding, percs slowly.	Severe: seepage, ponding.	Severe: ponding.	Severe: seepage, ponding.	Poor: ponding.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
51:					
Ft. Green	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.
Bivans	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
55:					
Pedro	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage, too sandy.	Severe: depth to rock.	Poor: depth to rock, seepage, too sandy.
Jonesville	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage, too sandy.	Severe: depth to rock, seepage.	Poor: depth to rock, seepage, too sandy.
Shadeville	Moderate: depth to rock, wetness, percs slowly.	Severe: seepage.	Severe: depth to rock, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
56:					
Moriah	Severe: wetness, percs slowly.	Severe: wetness, seepage.	Severe: depth to rock, wetness.	Severe: seepage.	Poor: thin layer.
Bushnell	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Mabel	Severe: wetness, percs slowly.	Severe: seepage.	Severe: depth to rock, wetness, too clayey.	Moderate: depth to rock, wetness.	Poor: too clayey, hard to pack.
57*: Paola	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
58:					
Boca	Severe: depth to rock, wetness, poor filter.	Severe: seepage, depth to rock, wetness.	Severe: depth to rock, wetness, too sandy.	Severe: depth to rock, seepage, wetness.	Poor: depth to rock, seepage, too sandy.
Holopaw	Severe: wetness, percs slowly, poor filter.	Severe: wetness, seepage.	Severe: depth to rock, too sandy, wetness.	Severe: wetness, seepage.	Poor: wetness, seepage, too sandy.
59:					
Aripeka	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Poor: depth to rock.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
59:					
Matmon	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Poor: depth to rock, wetness.
60:					
EauGallie	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: depth to rock, seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Holopaw	Severe: wetness, percs slowly, poor filter.	Severe: wetness, seepage.	Severe: depth to rock, too sandy, wetness.	Severe: wetness, seepage.	Poor: wetness, seepage, too sandy.
62:					
Millhopper	Moderate: wetness.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Bonneau	Moderate: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
65:					
Sparr	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Lochloosa	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
66:					
Levyville	Moderate: wetness, percs slowly.	Moderate: seepage, slope.	Severe: seepage, wetness.	Slight	Good.
Shadeville	Moderate: depth to rock, wetness, percs slowly.	Severe: seepage.	Severe: depth to rock, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
67:					
Immokalee	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: depth to rock, seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Janney	Severe: depth to rock, wetness, poor filter.	Severe: seepage, depth to rock, wetness.	Severe: depth to rock, seepage, wetness.	Severe: depth to rock, seepage, wetness.	Poor: depth to rock, seepage, too sandy.
68:					
Myakka	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: depth to rock, seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
68:					
Immokalee----------	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
69:					
Broward------------	Severe: depth to rock, wetness, poor filter.	Severe: seepage, depth to rock, wetness.	Severe: depth to rock, seepage, wetness.	Severe: depth to rock, seepage, wetness.	Poor: depth to rock, seepage, too sandy.
Lutterloh----------	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
70:					
Hallandale---------	Severe: depth to rock, wetness, poor filter.	Severe: seepage, depth to rock, wetness.	Severe: depth to rock, seepage, wetness.	Severe: depth to rock, seepage, wetness.	Poor: depth to rock, seepage, too sandy.
Boca---------------	Severe: depth to rock, wetness, poor filter.	Severe: seepage, depth to rock, wetness.	Severe: depth to rock, wetness, too sandy.	Severe: depth to rock, seepage, wetness.	Poor: depth to rock, seepage, too sandy.
Holopaw------------	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
71----------------- Pender	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness, thin layer.
72:					
Levyville----------	Moderate: wetness, percs slowly.	Moderate: seepage.	Severe: seepage, wetness.	Slight-----------	Good.
Hague--------------	Slight-----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
73*---------------- Orlando	Slight-----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Severe: seepage, too sandy.
74. Arents					
75*---------------- Orlando	Slight-----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Severe: seepage, too sandy.
76*---------------- Astatula	Slight-----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
77*: Candler	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
78: Micanopy	Severe: wetness, percs slowly.	Severe: seepage.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.

* Ground-water contamination is a hazard in areas where there are many septic tanks because of the poor filtering capacity of the soil.

TABLE 12.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2-----------------------Tavares	Good	Probable	Improbable: too sandy.	Poor: too sandy.
3-----------------------Orsino	Good	Probable	Improbable: too sandy.	Poor: too sandy.
4-----------------------Millhopper	Good	Probable	Improbable: too sandy.	Poor: too sandy.
5-----------------------Immokalee	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
6-----------------------Candler	Good	Probable	Improbable: too sandy.	Poor: too sandy.
7:				
Candler	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Apopka	Good	Probable	Improbable: too sandy.	Poor: too sandy.
8-----------------------Smyrna	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
9-----------------------Pomona	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
10----------------------Placid	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
11:				
Placid	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Samsula	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
12:				
Otela	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Candler	Good	Probable	Improbable: too sandy.	Poor: too sandy.
13----------------------Wekiva	Poor: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, wetness.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
14:				
Shadeville	Fair: depth to rock.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
Otela	Good	Probable	Improbable: too sandy.	Poor: too sandy.
15:				
Holopaw	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Pineda	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
16:				
Chobee	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
Gator	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
17 Adamsville	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
18 Wauchula	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
19 Sparr	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
21 Pompano	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
22 Holopaw	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
23 Zolfo	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
24 Terra Ceia	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
25:				
Pits.				
Dumps.				
26:				
Gator	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
26:				
Terra Ceia	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
27:				
Placid	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Popash	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
29:				
Chobee	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
Bradenton	Poor: wetness.	Probable	Improbable: too sandy.	Poor: thin layer, wetness.
31:				
Jonesville	Poor: depth to rock.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
Otela	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Seaboard	Poor: depth to rock.	Improbable: thin layer.	Improbable: too sandy.	Poor: depth to rock, too sandy.
32:				
Otela	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Tavares	Good	Probable	Improbable: too sandy.	Poor: too sandy.
33 Wulfert	Poor: low strength, wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness, excess salt.
34:				
Cassia	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
Pomello	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
35 Pineda	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
37, 38 Myakka	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
39:				
Waccasassa	Poor: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, wetness.
Demory	Poor: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, wetness.
40 Pineda	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
41 Demory	Poor: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, wetness.
42:				
Ousley	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
Albany	Fair: wetness.	Improbable: thin layer.	Improbable: excess fines.	Poor: too sandy.
43 Tidewater	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, wetness.
45 Cracker	Poor: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, excess salt, wetness.
46 Chobee	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
48:				
Lutterloh	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
Moriah	Fair: depth to rock, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
49 Hicoria	Poor: wetness.	Probable	Improbable: too sandy.	Poor: thin layer, wetness.
50 Hicoria	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
51:				
Ft. Green	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
51:				
Bivans	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
55:				
Pedro	Poor: depth to rock.	Improbable: thin layer.	Improbable: too sandy.	Poor: depth to rock, too sandy.
Jonesville	Poor: depth to rock.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
Shadeville	Fair: depth to rock.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
56:				
Moriah	Fair: depth to rock, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
Bushnell	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Mabel	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
57 Paola	Good	Probable	Improbable: too sandy.	Poor: too sandy.
58:				
Boca	Poor: depth to rock, thin layer, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
Holopaw	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
59:				
Aripeka	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Matmon	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
60:				
EauGallie	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
Holopaw	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
62:				
Millhopper	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Bonneau	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
65:				
Sparr	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
Lochloosa	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
66:				
Levyville	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Shadeville	Fair: depth to rock.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
67:				
Immokalee	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Janney	Poor: depth to rock, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
68:				
Myakka	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
Immokalee	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
69:				
Broward	Poor: depth to rock.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
Lutterloh	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
70:				
Hallandale	Poor: depth to rock, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: depth to rock, too sandy, wetness.
Boca	Poor: depth to rock, thin layer, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
Holopaw	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
71: Pender	Fair: thin layer, wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
72:				
Levyville	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Hague	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
73: Orlando	Slight	Probable	Improbable: too sandy.	Poor: too sandy.
74. Arents				
75: Orlando	Slight	Probable	Improbable: too sandy.	Poor: too sandy.
76: Astatula	Good	Probable	Improbable: too sandy.	Poor: too sandy.
77: Candler	Good	Probable	Improbable: too sandy.	Poor: too sandy.
78: Micanopy	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.

TABLE 13.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "s "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
2 Tavares	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing
3 Orsino	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing
4 Millhopper	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing
5 Immokalee	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing
6 Candler	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing
7:						
Candler	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
Apopka	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
8 Smyrna	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
9 Pomona	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
10----------------- Placid	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, fast intake, soil blowing.	Wetness, too sandy, soil blowing.
11:						
Placid-----------	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, fast intake, soil blowing.	Ponding, too sandy, soil blowing.
Samsula----------	Severe: seepage.	Severe: excess humus, ponding.	Severe: cutbanks cave.	Ponding, subsides.	Ponding, soil blowing.	Ponding, soil blowing.
12:						
Otela------------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.
Candler----------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
13----------------- Wekiva	Severe: depth to rock.	Severe: piping, wetness.	Severe: depth to rock.	Depth to rock	Wetness, droughty, fast intake.	Depth to rock, wetness, soil blowing.
14:						
Shadeville-------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
Otela------------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.
15:						
Holopaw----------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions
15:						
Pineda	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
16:						
Chobee	Slight	Severe: wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, flooding.	Wetness, soil blowing.	Wetness, soil blowing, percs slowly.
Gator	Severe: seepage.	Severe: excess humus, wetness.	Severe: cutbanks cave.	Flooding, subsides.	Wetness, flooding, soil blowing.	Wetness, soil blowing.
17 Adamsville	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
18 Wauchula	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Percs slowly	Wetness, fast intake, soil blowing.	Wetness, erodes easily, soil blowing.
19 Sparr	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
21 Pompano	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
22 Holopaw	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
23 Zolfo	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
24 Terra Ceia	Severe: seepage.	Excess humus, ponding.	Severe: cutbanks cave.	Ponding, subsides.	Ponding, soil blowing.	Ponding, soil blowing.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
25:						
Pits.						
Dumps.						
26:						
Gator	Severe: seepage.	Severe: excess humus, wetness.	Severe: cutbanks cave.	Flooding, subsides.	Wetness, flooding, soil blowing.	Wetness, soil blowing.
Terra Ceia	Severe: seepage.	Severe: excess humus, wetness.	Slight	Flooding, subsides.	Wetness, soil blowing, flooding.	Wetness, soil blowing.
27:						
Placid	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, fast intake, soil blowing.	Ponding, too sandy, soil blowing.
Popash	Severe: seepage.	Severe: seepage, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.
29:						
Chobee	Slight	Severe: wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, flooding.	Wetness, soil blowing.	Wetness, soil blowing, percs slowly.
Bradenton	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave, flooding.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
31:						
Jonesville	Moderate: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Depth to rock, too sandy, soil blowing.
Otela	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.
Seaboard	Severe: depth to rock.	Severe: seepage, piping.	Severe: depth to rock, cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Depth to rock, too sandy, soil blowing.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions
32:						
Otela	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.
Tavares	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
33 Wulfert	Severe: seepage.	Severe: seepage, piping, excess humus.	Severe: salty water, cutbanks cave.	Flooding, subsides, excess salt.	Wetness, soil blowing, flooding.	Wetness, soil blowing.
34:						
Cassia	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
Pomello	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
35 Pineda	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave, slow refill.	Percs slowly	Wetness, fast intake, droughty.	Wetness, soil blowing, percs slowly.
37 Myakka	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave, flooding.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
38 Myakka	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy, soil blowing.
39:						
Waccasassa	Severe: depth to rock.	Severe: piping, wetness.	Severe: depth to rock.	Depth to rock	Wetness	Depth to rock, wetness.
Demory	Severe: depth to rock.	Severe: thin layer, wetness.	Severe: depth to rock.	Depth to rock, flooding.	Wetness, droughty, depth to rock.	Depth to rock, wetness.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions
40: Pineda	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing
41: Demory	Severe: depth to rock.	Severe: thin layer, wetness.	Severe: depth to rock.	Depth to rock, flooding.	Wetness, depth to rock.	Depth to rock, wetness.
42:						
Ousley	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty.	Wetness, too sandy.
Albany	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.
43: Tidewater	Moderate: seepage, depth to rock.	Severe: wetness, excess salt.	Severe: salty water.	Flooding, subsides, excess salt.	Wetness, droughty, slow intake.	Wetness
45: Cracker	Severe: depth to rock.	Severe: piping, wetness, excess salt.	Severe: salty water, depth to rock.	Depth to rock, flooding, subsides.	Wetness, droughty, slow intake.	Depth to rock, wetness.
46: Chobee	Moderate: depth to rock.	Severe: thin layer, ponding.	Severe: slow refill.	Ponding, percs slowly.	Ponding, soil blowing, percs slowly.	Ponding, soil blowing, percs slowly
48:						
Lutterloh	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy, soil blowing
Moriah	Severe: seepage.	Severe: piping.	Severe: no water.	Favorable	Wetness, droughty.	Wetness, soil blowing
49: Hicoria	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly	Wetness, droughty, fast intake.	Wetness, soil blowing, percs slowly

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions
50: Hicoria	Severe: seepage.	Severe: piping, ponding.	Severe: cutbanks cave.	Ponding, percs slowly.	Ponding, droughty, fast intake.	Ponding, soil blowing, percs slowly.
51: Ft. Green	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, slope.	Wetness, fast intake, soil blowing.	Wetness, soil blowing, percs slowly.
Bivans	Moderate: slope.	Severe: wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, fast intake.	Wetness, soil blowing.
55: Pedro	Severe: depth to rock.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake.	Depth to rock, too sandy, soil blowing.
Jonesville	Moderate: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Depth to rock, too sandy, soil blowing.
Shadeville	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
56: Moriah	Severe: seepage.	Severe: piping.	Severe: no water.	Favorable	Wetness, droughty.	Wetness, soil blowing.
Bushnell	Severe: too sandy.	Severe: hard to pack.	Severe: no water.	Percs slowly, depth to rock.	Wetness, droughty.	Depth to rock, wetness, soil blowing.
Mabel	Moderate: depth to rock.	Severe: hard to pack.	Severe: no water.	Percs slowly	Wetness, fast intake.	Wetness, soil blowing, percs slowly.
57: Paola	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
58:						
Boca	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: depth to rock, cutbanks cave.	Depth to rock, cutbanks cave.	Wetness, droughty, fast intake.	Depth to rock, wetness, too sandy.
Holopaw	Severe: seepage.	Severe: piping, seepage, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, fast intake, droughty.	Soil blowing, too sandy, wetness.
59:						
Aripeka	Moderate: depth to rock.	Severe: thin layer, wetness.	Severe: depth to rock, cutbanks cave.	Percs slowly, depth to rock.	Wetness, droughty, fast intake.	Depth to rock, wetness, soil blowing.
Matmon	Severe: depth to rock.	Severe: piping, wetness.	Severe: slow refill, depth to rock.	Depth to rock	Wetness, droughty, fast intake.	Depth to rock, wetness, soil blowing.
60:						
EauGallie	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
Holopaw	Severe: seepage.	Severe: piping, seepage, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, fast intake, droughty.	Soil blowing, too sandy, wetness.
62:						
Millhopper	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
Bonneau	Severe: seepage.	Slight	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing
65:						
Sparr	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave, slope.	Slope, wetness, droughty.	Wetness, too sandy, soil blowing.
Lochloosa	Severe: seepage.	Moderate: wetness.	Severe: cutbanks cave.	Slope	Wetness, fast intake, soil blowing.	Wetness, soil blowing.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
66:						
Levyville	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, fast intake, soil blowing.	Soil blowing--
Shadeville	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
67:						
Immokalee	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
Janney	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: depth to rock, cutbanks cave.	Depth to rock, cutbanks cave.	Wetness, droughty, fast intake.	Depth to rock, wetness, too sandy.
68:						
Myakka	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing
Immokalee	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing
69:						
Broward	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: depth to rock, cutbanks cave.	Depth to rock, cutbanks cave.	Wetness, droughty, fast intake.	Depth to rock, wetness, too sandy.
Lutterloh	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing
70:						
Hallandale	Severe: depth to rock.	Severe: seepage, piping, wetness.	Severe: depth to rock, cutbanks cave.	Depth to rock, cutbanks cave.	Wetness, droughty, fast intake.	Depth to rock wetness, too sandy.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
70:						
Boca	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: depth to rock, cutbanks cave.	Depth to rock, cutbanks cave.	Wetness, droughty, fast intake.	Depth to rock, wetness, too sandy.
Holopaw	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
71 Pender	Moderate: seepage.	Severe: wetness.	Severe: cutbanks cave.	Favorable	Wetness, fast intake.	Erodes easily, wetness.
72:						
Levyville	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Fast intake, soil blowing.	Soil blowing
Hague	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing
73 Orlando	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
74. Arents						
75 Orlando	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
76 Astatula	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
77 Candler	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
78 Micanopy	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Slope, wetness.	Wetness, soil blowing.

TABLE 14.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
2----------------- Tavares	0-7	Fine sand--------	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	7-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
3----------------- Orsino	0-4	Fine sand--------	SP	A-3	0	100	100	88-100	1-3	---	NP
	4-13	Sand, fine sand	SP	A-3	0	100	100	88-100	1-3	---	NP
	13-80	Sand, fine sand	SP	A-3	0	100	100	88-100	2-5	---	NP
4----------------- Millhopper	0-63	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	100	75-100	5-20	---	NP
	63-80	Fine sandy loam, sandy clay loam.	SM, SC-SM, SC	A-2-4, A-4	0	100	100	75-100	18-40	<28	NP-10
5----------------- Immokalee	0-9	Fine sand--------	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	9-38	Fine sand, sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	38-43	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	70-100	5-21	---	NP
	43-80	Fine sand, sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
6----------------- Candler	0-6	Fine sand--------	SP, SP-SM	A-3	0	100	100	75-100	2-8	---	NP
	6-60	Sand, fine sand	SP, SP-SM	A-3	0	100	100	75-100	2-8	---	NP
	60-80	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	75-100	5-12	---	NP
7:											
Candler---------	0-8	Fine sand--------	SP, SP-SM	A-3	0	100	100	75-100	2-8	---	NP
	8-52	Sand, fine sand	SP, SP-SM	A-3	0	100	100	75-100	2-8	---	NP
	52-80	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	75-100	5-12	---	NP
Apopka----------	0-71	Fine sand--------	SP, SP-SM	A-3	0	100	100	85-100	3-10	---	NP
	71-80	Fine sandy loam, sandy clay loam.	SC-SM, SC	A-2-4, A-2-6, A-4, A-6	0	98-100	95-100	60-95	20-40	20-40	4-20
8----------------- Smyrna	0-19	Fine sand, sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	19-23	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
	23-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
9----------------- Pomona	0-4	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	4-23	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	23-30	Sand, fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	5-15	---	NP
	30-61	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	61-80	Sandy clay loam, sandy loam, sandy clay.	SC, SC-SM, SM	A-2, A-4, A-6	0	100	100	85-100	25-50	<40	NP-16
10---------------- Placid	0-19	Fine sand--------	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP
	19-80	Fine sand, sand, loamy fine sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
11:											
Placid----------	0-14	Fine sand--------	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP
	14-80	Sand, fine sand, loamy fine sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP
Samsula---------	0-47	Muck-------------	PT	A-8	---	---	---	---	---	---	---
	47-80	Sand, fine sand, loamy fine sand.	SP-SM, SM, SP	A-3, A-2-4	0	100	100	80-100	2-20	---	NP
12:											
Otela-----------	0-50	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	97-100	95-100	75-100	5-15	---	NP
	50-68	Sandy clay loam, sandy loam, loamy fine sand.	SC, SC-SM, SM	A-2-6, A-2-4, A-4, A-6	0	97-100	95-100	75-100	20-50	<40	NP-15
	68-80	Sandy clay loam, sandy clay, clay.	SC, CL, CH	A-6, A-7	0-5	97-100	95-100	75-100	45-95	35-65	20-39
Candler---------	0-7	Fine sand--------	SP, SP-SM	A-3	0	100	100	75-100	2-8	---	NP
	7-75	Sand, fine sand	SP, SP-SM	A-3	0	100	100	75-100	2-8	---	NP
	75-80	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	75-100	5-12	---	NP
13--------------- Wekiva	0-4	Fine sand--------	SM, SP-SM	A-3, A-2-4	0-3	98-100	98-100	98-100	6-18	---	NP
	4-9	Fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0-3	98-100	98-100	98-100	6-18	---	NP
	9-18	Fine sandy loam, sandy clay loam.	SC, SC-SM, SM	A-6, A-2-4, A-4, A-2-6	0-5	98-100	98-100	97-100	25-45	<40	NP-24
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
14:											
Shadeville------	0-8	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	5-15	---	NP
	8-35	Fine sand--------	SP-SM, SM	A-3, A-2-4	0-2	97-100	95-100	85-100	5-15	---	NP
	35-60	Fine sandy loam, sandy loam, sandy clay loam.	SC-SM, SC, SM	A-2-4, A-2-6, A-4, A-6	0-2	97-100	95-100	85-100	20-45	<35	NP-20
	60-64	Fine sandy loam, sandy clay loam, sandy clay.	SC, CL, CH, SM	A-2, A-4, A-6, A-7	0-5	95-100	95-100	85-100	22-60	23-55	7-25
	64	Weathered bedrock	---	---	---	---	---	---	---	---	---
Otela-----------	0-60	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	97-100	95-100	75-100	5-15	---	NP
	60-80	Sandy clay loam, fine sandy loam, loamy fine sand.	SC, SC-SM, SM	A-2-6, A-2-4, A-4, A-6	0-5	97-100	95-100	75-100	20-50	<40	NP-15
15:											
Holopaw---------	0-60	Fine sand, sand	SP, SP-SM	A-3	0	100	100	75-90	2-10	---	NP
	60-80	Fine sandy loam, sandy clay loam.	SM, SC-SM, SC	A-2-4, A-2-6	0	100	100	65-90	15-34	<30	NP-12

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
15:											
Pineda----------	0-35	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-95	2-5	---	NP
	35-52	Fine sandy loam, sandy clay loam.	SC, SC-SM	A-2-4, A-2-6	0	100	100	80-95	15-35	20-30	4-12
	52-80	Sand, loamy sand, fine sand.	SP-SM, SM, SP	A-3, A-2-4	0	100	100	80-95	4-15	---	NP
16:											
Chobee----------	0-19	Fine sandy loam	SP-SM, SM	A-2-4	0	100	100	85-99	12-25	<40	NP-10
	19-42	Sandy clay loam	SC	A-2-6, A-2-7, A-6, A-7	0	100	100	85-99	25-45	35-45	20-25
	42-80	Loamy fine sand, fine sand, fine sandy loam.	SP-SM, SM, SC, SC-SM	A-2-4, A-2-6, A-6, A-7	0	100	100	80-99	12-35	<30	NP-11
Gator-----------	0-26	Muck-------------	PT	A-8	---	---	---	---	---	---	---
	26-52	Sandy clay loam, sandy loam, fine sandy loam.	SC, SC-SM	A-2, A-4, A-6	0	100	95-100	80-95	20-50	20-40	4-20
	52-80	Fine sand, sand, loamy fine sand.	SP-SM	A-3, A-2-4	0	100	100	80-99	5-12	---	NP
17--------------- Adamsville	0-14	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	14-80	Fine sand, sand	SP-SM, SP	A-3, A-2-4	0	100	100	90-100	2-12	---	NP
18--------------- Wauchula	0-4	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	4-18	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	18-27	Sand, fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	8-25	---	NP
	27-32	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-20	---	NP
	32-61	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC-SM, SC	A-2-4, A-2-6, A-4, A-6	0	100	100	90-100	25-50	<40	NP-20
	61-80	Loamy fine sand, fine sandy loam.	SM, SC-SM	A-2-4	0	100	100	85-100	15-25	<26	NP-8
19--------------- Sparr	0-6	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	100	75-99	5-14	---	NP
	6-54	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	75-99	5-14	---	NP
	54-80	Sandy clay loam, fine sandy loam.	SC, SC-SM	A-2, A-4, A-6	0	100	100	75-99	28-50	22-40	5-15
21--------------- Pompano	0-80	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	100	75-100	1-12	---	NP
22--------------- Holopaw	0-54	Fine sand--------	SP, SP-SM	A-3	0	100	95-100	70-95	2-10	---	NP
	54-80	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC-SM	A-2-4	0	100	95-100	70-99	15-30	<25	NP-7

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
23-------------- Zolfo	0-4	Sand-------------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	4-71	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-18	---	NP
	71-80	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-18	---	NP
24-------------- Terra Ceia	0-59	Muck-------------	PT	A-8	---	---	---	---	---	---	---
	59-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-90	2-12	---	NP
25: Pits.											
Dumps.											
26: Gator-----------	0-38	Muck-------------	PT	A-8	---	---	---	---	---	---	---
	38-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SC-SM	A-2, A-4, A-6	0	100	100	80-95	20-50	20-40	4-20
Terra Ceia------	0-80	Muck-------------	PT	A-8	---	---	---	---	---	---	---
27: Placid----------	0-22	Fine sand--------	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP
	22-80	Sand, fine sand, loamy fine sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP
Popash----------	0-12	Fine sand--------	SP-SM, SM, SC-SM	A-3, A-2-4	0	100	100	95-100	5-20	<20	NP-5
	12-45	Fine sand, sand	SP-SM	A-3, A-2-4	0	100	100	95-100	5-12	---	NP
	45-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC-SM, SC	A-2-4, A-2-6	0	100	100	95-100	20-35	<40	NP-15
29: Chobee----------	0-11	Fine sandy loam	SP-SM, SM	A-2-4	0	100	100	85-99	12-25	<40	NP-10
	11-48	Sandy clay loam	SC	A-2-6, A-2-7, A-6, A-7	0	100	100	85-99	25-45	35-45	20-25
	48-80	Loamy fine sand, fine sand, fine sandy loam.	SP-SM, SM, SC, SC-SM	A-2-4, A-2-6, A-6, A-7	0	100	100	80-99	12-35	<30	NP-11
Bradenton-------	0-4	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	4-9	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	9-28	Sandy loam, fine sandy loam, sandy clay loam.	SC, SC-SM	A-2-4, A-2-6	0	100	99-100	80-100	20-35	<40	4-18
	28-80	Fine sand, loamy fine sand, fine sandy loam.	SP-SM, SM, SC-SM, SC	A-3, A-2-4, A-2-6	0-2	97-100	95-100	80-100	5-35	<40	NP-18

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
31:											
Jonesville	0-5	Fine sand	SP-SM, SM	A-2-4, A-3	0-2	100	100	80-95	5-15	---	NP
	5-27	Fine sand	SP-SM, SM	A-2-4, A-3	0-2	100	100	80-95	5-15	---	NP
	27-35	Fine sandy loam, sandy clay loam.	SC-SM, SC, SM	A-2-4, A-2-6, A-4, A-6	0-10	90-100	85-100	80-95	20-40	<40	NP-15
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---
Otela	0-58	Fine sand	SP-SM, SM	A-3, A-2-4	0	97-100	95-100	75-95	5-15	---	NP
	58-66	Fine sandy loam, sandy clay loam.	SC, SC-SM, SM	A-4, A-6, A-2-4, A-2-6	0-5	97-100	95-100	75-95	20-50	<40	NP-15
	66	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Seaboard	0-8	Fine sand	SP-SM, SP	A-3, A-2-4	0-2	100	95-100	85-95	2-5	---	NP
	8-17	Fine sand	SP-SM, SP	A-3, A-2-4	0-5	100	95-100	85-95	2-5	---	NP
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
32:											
Otela	0-68	Fine sand	SP-SM, SM	A-3, A-2-4	0	97-100	95-100	75-100	5-15	---	NP
	68-80	Sandy clay loam, fine sandy loam, loamy fine sand.	SC, SC-SM, SM	A-2-6, A-2-4, A-4, A-6	0-5	97-100	95-100	75-100	20-50	<40	NP-15
Tavares	0-9	Fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	9-80	Sand, fine sand	SP, SP-SM	A-3	0-2	100	95-100	85-100	2-10	---	NP
33 Wulfert	0-30	Muck	PT	A-8	---	---	---	---	---	---	---
	30-80	Fine sand, loamy fine sand, mucky loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	5-18	---	NP
34:											
Cassia	0-24	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-100	2-7	---	NP
	24-55	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-20	---	NP
	55-80	Sand, fine sand	SP, SP-SM	A-3	0-2	100	100	90-100	2-10	---	NP
Pomello	0-40	Fine sand, sand	SP, SP-SM	A-3	0	100	100	60-100	1-8	---	NP
	40-80	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0-2	100	100	60-100	6-15	---	NP
35 Pineda	0-25	Fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	25-50	Fine sandy loam, sandy clay loam.	SM, SC-SM, SC	A-2-4, A-2-6	0	100	100	65-85	13-35	<30	NP-15
	50	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
37--------------- Myakka	0-8	Mucky sand-------	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	8-21	Fine sand, sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	21-40	Fine sand, sand, loamy sand.	SM, SP-SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
	40-80	Fine sand, sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
38--------------- Myakka	0-5	Sand-------------	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	5-26	Sand, fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	26-58	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	85-100	5-20	---	NP
	58-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-8	---	NP
39: Waccasassa------	0-2	Sandy clay loam	SC, SC-SM, SM	A-4, A-6, A-2-4, A-2-6	0-5	98-100	98-100	95-100	25-50	<40	NP-24
	2-12	Fine sandy loam, sandy clay loam.	SC, SC-SM, SM	A-4, A-6, A-2-4, A-2-6	0-5	98-100	98-100	95-100	25-50	<40	NP-24
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Demory----------	0-6	Sandy clay loam	SC, SC-SM, SM	A-2-4, A-2-6	0-5	98-100	98-100	95-100	13-35	<40	NP-24
	6-11	Fine sandy loam, sandy clay loam.	SC, SC-SM, SM	A-4, A-6, A-2-4, A-2-6	0-5	98-100	98-100	95-100	25-50	<40	NP-24
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
40--------------- Pineda	0-4	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-95	2-8	---	NP
	4-32	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-95	2-10	---	NP
	32-80	Sandy loam, fine sandy loam, sandy clay loam.	SC, SC-SM, SM	A-2-4, A-2-6	0	100	100	65-95	15-35	<35	NP-20
41--------------- Demory	0-3	Muck-------------	OL, PT	A-8	0-1	---	---	---	---	---	---
	3-9	Fine sandy loam, sandy clay loam.	SC, SC-SM, SM	A-4, A-6, A-2-4, A-2-6	0-5	98-100	98-100	95-100	25-50	<40	NP-24
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
42: Ousley----------	0-12	Fine sand--------	SP-SM, SM	A-2, A-3	0	100	100	70-100	5-25	---	NP
	12-80	Sand, fine sand, coarse sand.	SP-SM, SM, SP	A-1, A-2, A-3	0	100	100	36-99	2-15	---	NP
Albany----------	0-50	Fine sand--------	SM, SP-SM	A-2	0	100	100	75-90	10-20	---	NP
	50-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM, SC-SM	A-2, A-4, A-6	0	100	100	70-100	20-50	<40	NP-17

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
43-------------- Tidewater	0-24	Mucky clay, silty clay.	SC, CH, CL	A-7-6, A-6	0	100	100	98-100	40-95	30-70	11-40
	24-40	Sandy clay loam, fine sandy loam.	SC, CL	A-6	0	100	100	98-100	35-55	28-45	10-24
	40-76	Sand to sandy clay loam.	SP-SM, SM, SC, CL	A-3, A-4, A-6	0	100	100	98-100	5-55	<45	NP-24
	76	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
45-------------- Cracker	0-4	Mucky clay-------	SC, CH, CL	A-7-6, A-6	0	100	100	98-100	40-95	30-70	11-40
	4-12	Fine sandy loam, sandy clay loam, clay loam.	SC, SC-SM, SM, CL	A-4, A-6, A-2-4, A-2-6	0	100	100	98-100	20-75	<40	NP-24
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
46-------------- Chobee	0-11	Fine sandy loam	SP-SM, SM	A-2-4	0	100	95-100	85-100	12-25	<40	NP-10
	11-68	Sandy clay loam, sandy loam, fine sandy loam.	SC	A-2, A-6, A-7-6	0	100	95-100	80-100	20-45	25-45	10-20
	68	Weathered bedrock	---	---	---	---	---	---	---	---	---
48:											
Lutterloh-------	0-7	Fine sand--------	SP, SP-SM	A-3, A-2-4	0-3	99-100	99-100	85-100	2-12	---	NP
	7-57	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0-3	99-100	99-100	85-100	2-12	---	NP
	57-69	Fine sandy loam, sandy clay loam.	SM, SC-SM, SC	A-2-4, A-2-6, A-4, A-6	0-3	99-100	99-100	85-100	25-41	<40	NP-23
	69-80	Sandy clay loam, sandy clay.	SC, CL, CH	A-6, A-7	0-3	99-100	99-100	90-100	40-60	35-70	20-42
Moriah----------	0-8	Fine sand--------	SP-SM	A-3, A-2-4	0-3	100	100	95-100	5-12	---	NP
	8-35	Sand, fine sand	SP-SM	A-3, A-2-4	0-3	98-100	98-100	95-100	5-12	---	NP
	35-39	Fine sandy loam, sandy clay loam.	SC, SC-SM, SM	A-4, A-6, A-2-4, A-2-6	0-5	98-100	98-100	90-100	25-45	<40	NP-24
	39-51	Sandy clay, clay	CH, CL	A-7	0-5	98-100	98-100	90-100	55-80	45-80	20-50
	51	Weathered bedrock	---	---	---	---	---	---	---	---	---
49-------------- Hicoria	0-17	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	100	90-100	2-12	---	NP
	17-23	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-20	---	NP
	23-80	Fine sandy loam, sandy clay loam.	SC-SM, SC, SM	A-2-4, A-2-6, A-4, A-6	0	100	100	90-100	20-45	<30	NP-15
50-------------- Hicoria	0-15	Loamy fine sand	SP-SM, SM, SC-SM	A-3, A-2-4	0	100	100	90-100	5-20	<20	NP-5
	15-38	Sand, fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-20	---	NP
	38-80	Sandy loam, fine sandy loam, sandy clay loam.	SC-SM, SC, SM	A-2-4, A-2-6, A-4, A-6	0	100	100	90-100	20-40	<30	NP-15

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
51:											
Ft. Green	0-7	Fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	90-99	2-12	---	NP
	7-33	Fine sand, loamy fine sand.	SP, SP-SM	A-3, A-2-4	0-2	98-100	98-100	95-100	5-20	---	NP
	33-80	Fine sandy loam, sandy clay loam.	SM, SC-SM, SC	A-2-4	0-5	95-100	95-100	90-100	15-30	<35	NP-10
Bivans	0-17	Fine sand	SP-SM, SM	A-3, A-2-4	0	95-100	90-100	80-100	5-15	---	NP
	17-70	Sandy clay loam, sandy clay.	SC, CL	A-6, A-7	0	95-100	95-100	82-100	36-55	30-46	15-26
	70-80	Sandy clay loam, sandy clay, clay.	SC, CL, CH	A-6, A-7	0	100	100	85-100	38-69	32-58	17-36
55:											
Pedro	0-11	Fine sand	SP-SM	A-3, A-2-4	0-1	100	100	90-100	5-12	---	NP
	11-15	Sandy clay loam, fine sandy loam.	SC	A-2, A-4, A-6	0-1	90-100	85-100	80-100	25-40	18-40	4-20
	15-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Jonesville	0-9	Fine sand	SP-SM, SM	A-2-4, A-3	0-1	100	100	80-95	5-15	---	NP
	9-31	Fine sand	SP-SM, SM	A-2-4, A-3	0-2	100	100	80-95	5-15	---	NP
	31-35	Fine sandy loam, sandy clay loam.	SC-SM, SC, SM	A-2-4, A-2-6, A-4, A-6	0-10	90-100	85-100	80-95	20-40	<40	NP-15
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---
Shadeville	0-10	Fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	5-15	---	NP
	10-23	Fine sand	SP-SM, SM	A-3, A-2-4	0-2	97-100	95-100	85-100	5-15	---	NP
	23-45	Fine sandy loam, sandy clay loam.	SC-SM, SC, SM	A-2-4, A-2-6, A-4, A-6	0-5	97-100	95-100	85-100	20-45	<35	NP-20
	45	Weathered bedrock	---	---	---	---	---	---	---	---	---
56:											
Moriah	0-9	Fine sand	SP-SM	A-3, A-2-4	0-3	100	100	95-100	5-12	---	NP
	9-28	Sand, fine sand	SP-SM	A-3, A-2-4	0-3	98-100	98-100	95-100	5-12	---	NP
	28-52	Fine sandy loam, sandy clay loam.	SC, SC-SM, SM	A-4, A-6, A-2-4, A-2-6	0-5	98-100	98-100	90-100	25-45	<40	NP-24
	52-68	Sandy clay, clay	CH, CL	A-7	0-5	98-100	98-100	90-100	55-80	45-80	20-50
	68	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
56:											
Bushnell	0-6	Fine sand	SP-SM, SM	A-3, A-2-4	0-3	98-100	98-100	95-100	5-20	---	NP
	6-10	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0-3	98-100	98-100	95-100	5-20	---	NP
	10-16	Sandy clay, sandy clay loam.	SC, CL, CH	A-2-6, A-6, A-7	0-3	95-100	95-100	95-100	30-55	30-55	15-40
	16-26	Sandy clay, clay	CL, CH	A-7	0-5	90-100	90-100	90-100	55-80	45-80	20-50
	26	Weathered bedrock	---	---	---	---	---	---	---	---	---
Mabel	0-7	Fine sand	SP-SM, SP, SM	A-2-4, A-3	0-3	98-100	98-100	95-100	3-23	---	NP
	7-14	Fine sand, loamy fine sand.	SP-SM, SP, SM	A-2-4, A-3	0-3	98-100	98-100	95-100	3-23	---	NP
	14-18	Sandy clay loam, sandy clay.	SC, CL, CH	A-2, A-6, A-7	0-3	95-100	95-100	95-100	30-55	30-55	15-40
	18-31	Sandy clay, clay	CH, MH	A-7	0-5	90-100	90-100	90-100	55-80	50-80	20-50
	31-53	Sandy clay, clay	CH	A-7	0-5	90-100	90-100	90-100	65-85	65-85	40-55
	53	Weathered bedrock	---	---	---	---	---	---	---	---	---
57	0-2	Fine sand	SP	A-3	0	100	100	85-100	1-2	---	NP
Paola	2-11	Sand, fine sand	SP	A-3	0	100	100	85-100	1-2	---	NP
	11-80	Sand, fine sand	SP	A-3	0	100	100	80-100	1-4	---	NP
58:											
Boca	0-5	Fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	5-29	Fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	29-37	Sandy clay loam, fine sandy loam.	SC, SC-SM	A-2, A-6, A-4	0-2	95-100	95-100	80-100	17-40	16-37	5-20
	37	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Holopaw	0-43	Fine sand	SP, SP-SM	A-3	0	100	100	70-95	2-10	---	NP
	43-65	Sandy clay loam, fine sandy loam, sandy loam.	SM, SC-SM	A-2-4	0-2	99-100	95-100	70-99	15-30	<25	NP-7
	65	Weathered bedrock	---	---	---	---	---	---	---	---	---
59:											
Aripeka	0-6	Fine sand	SM, SP-SM	A-3, A-2-4	0-5	98-100	98-100	98-100	5-20	---	NP
	6-12	Fine sand	SP-SM	A-3, A-2-4	0-5	98-100	98-100	98-100	5-12	---	NP
	12-24	Fine sandy loam, sandy clay loam.	SC, SC-SM	A-6, A-2-4, A-2-6, A-4	0-5	98-100	98-100	95-100	25-40	<40	7-21
	24	Weathered bedrock	---	---	---	---	---	---	---	---	---
Matmon	0-6	Fine sand	SM, SP-SM	A-3, A-2-4	0-5	99-100	99-100	98-100	5-18	---	NP
	6-15	Fine sandy loam, sandy clay loam.	SC, SC-SM, SM, CL	A-2, A-4, A-6, A-7	0-5	99-100	99-100	95-100	25-52	<41	NP-25
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
60:											
EauGallie	0-16	Fine sand	SP, SP-SM	A-3	0	100	100	80-98	2-5	---	NP
	16-19	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	80-98	5-20	---	NP
	19-55	Fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-98	2-12	---	NP
	55-61	Fine sandy loam, sandy clay loam.	SM, SC-SM, SC	A-2-4, A-2-6	0	100	100	80-98	20-35	<40	NP-20
	61	Weathered bedrock	---	---	---	---	---	---	---	---	---
Holopaw	0-42	Fine sand	SP, SP-SM	A-3	0	100	100	70-95	2-10	---	NP
	42-52	Sandy clay loam, fine sandy loam.	SM, SC-SM	A-2-4	0-2	99-100	95-100	70-99	15-30	<25	NP-7
	52	Weathered bedrock	---	---	---	---	---	---	---	---	---
62:											
Millhopper	0-74	Fine sand	SP-SM, SM	A-3, A-2-4	0-1	100	100	75-100	5-20	---	NP
	74-80	Fine sandy loam, sandy clay loam.	SM, SC-SM, SC	A-2-4, A-4	0-2	100	100	75-100	18-40	<28	NP-10
Bonneau	0-29	Fine sand	SP-SM, SM	A-3, A-2-4	0-1	100	100	75-100	5-19	---	NP
	29-60	Sandy clay loam, fine sandy loam, sandy loam.	SC, SC-SM	A-2-6, A-2-4	0-2	100	100	85-100	25-35	20-35	4-18
	60-80	Sandy clay loam, fine sandy loam.	SC, SC-SM	A-2-6, A-2-4	0-2	100	100	85-100	25-35	20-35	4-18
65:											
Sparr	0-8	Fine sand	SP-SM, SM	A-3, A-2-4	0-1	100	100	75-99	5-14	---	NP
	8-50	Fine sand	SP-SM, SM	A-3, A-2-4	0-2	100	100	75-99	5-14	---	NP
	50-80	Sandy clay loam, fine sandy loam.	SC, SC-SM	A-2, A-4, A-6	0-2	100	100	75-99	28-50	22-40	5-15
Lochloosa	0-38	Fine sand	SP-SM, SM	A-2-4, A-3	0-2	95-100	95-100	90-98	8-20	---	NP
	38-66	Sandy clay loam, fine sandy loam.	SC, SC-SM	A-2, A-4, A-6	0-2	95-100	95-100	90-98	25-40	25-40	5-18
	66-80	Sandy clay loam, fine sandy loam.	SC, SC-SM	A-2, A-4, A-6	0-2	95-100	95-100	90-98	25-40	25-40	5-18
66:											
Levyville	0-8	Loamy fine sand	SP-SM, SM	A-3, A-2	0-2	98-100	98-100	90-100	5-15	---	NP
	8-80	Sandy clay loam, fine sandy loam.	SM, SC, SC-SM	A-2-4, A-2-6, A-4	0-2	98-100	98-100	93-100	24-36	<37	NP-21

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
66:											
Shadeville	0-9	Fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	5-15	---	NP
	9-26	Fine sand	SP-SM, SM	A-3, A-2-4	0-2	97-100	95-100	85-100	5-15	---	NP
	26-41	Fine sandy loam, sandy clay loam.	SC-SM, SC, SM	A-2-4, A-2-6, A-4, A-6	0-2	97-100	95-100	85-100	20-45	<35	NP-20
	41-63	Fine sandy loam, sandy clay loam, sandy clay.	SC, CL, CH, SM	A-2, A-4, A-6, A-7	0-5	95-100	95-100	85-100	22-60	23-55	7-25
	63	Weathered bedrock	---	---	---	---	---	---	---	---	---
67:											
Immokalee	0-4	Fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	4-41	Fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	41-49	Fine sand	SP-SM, SM	A-3, A-2-4	0-2	100	100	80-100	5-15	---	NP
	49	Weathered bedrock	---	---	---	---	---	---	---	---	---
Janney	0-8	Fine sand	SP-SM	A-3	0	100	100	95-100	5-10	---	NP
	8-20	Fine sand	SP, SP-SM	A-3	0	100	100	95-100	2-10	---	NP
	20-27	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0-2	100	100	95-100	5-20	---	NP
	27	Weathered bedrock	---	---	---	---	---	---	---	---	---
68:											
Myakka	0-24	Fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	24-40	Fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	85-100	5-20	---	NP
	40-54	Fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-8	---	NP
	54	Weathered bedrock	---	---	---	---	---	---	---	---	---
Immokalee	0-6	Fine sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	6-37	Fine sand, sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	37-70	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	70-100	5-21	---	NP
	70-80	Fine sand, sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
69:											
Broward	0-6	Fine sand	SP-SM	A-3, A-2-4	0	100	100	85-100	5-12	---	NP
	6-25	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0-2	100	100	85-100	2-12	---	NP
	25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Lutterloh	0-52	Fine sand, sand	SP, SP-SM	A-3	0	100	100	85-100	2-5	---	NP
	52-61	Fine sandy loam, very fine sandy loam, sandy clay loam.	SM, SC-SM, SC	A-2-4, A-2-6, A-4, A-6	0-3	100	99-100	85-100	25-40	<35	NP-20
	61	Weathered bedrock.	---	---	---	---	---	---	---	---	---
70:											
Hallandale	0-4	Fine sand	SP, SP-SM	A-3	0	100	100	90-100	2-6	---	NP
	4-19	Fine sand	SP, SP-SM	A-3, A-2-4	0-3	97-100	95-100	90-100	2-12	---	NP
	19	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
70:											
Boca	0-4	Fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	4-21	Fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	21-25	Sandy clay loam, fine sandy loam.	SC, SC-SM	A-2, A-6, A-4	0-2	95-100	95-100	80-100	17-40	16-37	5-20
	25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Holopaw	0-52	Fine sand	SP, SP-SM	A-3	0	100	100	70-95	2-10	---	NP
	52-80	Sandy clay loam, fine sandy loam.	SM, SC-SM	A-2-4	0-2	100	95-100	70-99	15-30	<25	NP-7
71 Pender	0-14	Loamy fine sand, fine sand.	SM	A-2	0	100	100	70-99	14-28	---	NP
	14-58	Sandy clay loam	SC, CL	A-6, A-7	0	100	100	80-100	35-70	30-45	10-20
	58-80	Loamy fine sand to sandy clay.	SP-SM, SM, SC-SM, SC, CL	A-3, A-4, A-6, A-7	0	100	100	70-100	14-70	<45	NP-25
72:											
Levyville	0-15	Fine sand	SP-SM, SM	A-3, A-2-4	0-2	98-100	98-100	90-100	5-15	---	NP
	15-55	Sandy clay loam, fine sandy loam.	SM, SC, SC-SM	A-2-4, A-2-6	0-2	98-100	98-100	93-100	24-36	<37	NP-21
	55-80	Fine sand to sandy clay loam.	SP-SM, SM, SC, SC-SM	A-3, A-2, A-6	0-2	98-100	98-100	90-100	5-36	<37	NP-21
Hague	0-24	Fine sand	SP-SM	A-3, A-2-4	0	100	98-100	75-99	5-12	---	NP
	24-50	Sandy clay loam, fine sandy loam.	SM, SC-SM, SC	A-2, A-4, A-6	0-2	100	98-100	80-99	22-40	<35	NP-16
	50-80	Loamy sand, loamy fine sand.	SM	A-2-4	0	100	100	80-99	15-25	---	NP
73 Orlando	0-11	Fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	1-12	---	NP
	11-80	Fine sand	SP-SM	A-3, A-2-4	0	100	100	85-100	5-12	---	NP
74. Arents											
75 Orlando	0-11	Fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	1-12	---	NP
	11-80	Fine sand	SP-SM	A-3, A-2-4	0	100	100	85-100	5-12	---	NP
76 Astatula	0-5	Fine sand	SP, SP-SM	A-3	0	100	100	75-100	1-7	---	NP
	5-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	75-100	1-7	---	NP
77 Candler	0-6	Fine sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	6-60	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	60-80	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	95-100	75-100	5-12	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
78--------------- Micanopy	0-7	Loamy fine sand	SM, SP-SM	A-2-4	0-2	95-100	95-100	90-100	11-25	---	NP
	7-15	Sandy clay, sandy clay loam.	SC	A-2, A-6, A-7	0-2	95-100	95-100	90-100	30-50	25-45	12-25
	15-21	Sandy clay-------	CH	A-7	0-2	95-100	95-100	90-100	51-60	51-65	25-35
	21-56	Sandy clay, clay	CH	A-7	0-2	95-100	95-100	90-100	51-70	51-75	25-45
	56-80	Sandy clay, sandy clay loam, clay.	CH, SC	A-7, A-6	0-2	95-100	95-100	90-100	45-55	35-70	17-42

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
2----------------- Tavares	0-7	0-4	1.25-1.65	>6.0	0.05-0.10	3.6-6.0	<2	Low--------	0.10	5	1	.5-2
	7-80	0-4	1.40-1.70	>6.0	0.02-0.05	3.6-6.0	<2	Low--------	0.10			
3----------------- Orsino	0-4	<1	1.25-1.50	>20	0.02-0.08	3.6-6.0	<2	Low--------	0.10	5	1	<1
	4-13	<1	1.35-1.60	>20	0.02-0.07	3.6-6.0	<2	Low--------	0.10			
	13-80	<2	1.35-1.60	>20	0.02-0.08	3.6-6.0	<2	Low--------	0.10			
4----------------- Millhopper	0-63	2-8	1.35-1.67	6.0-20	0.05-0.10	4.5-6.5	<2	Low--------	0.10	5	1	.5-2
	63-80	12-28	1.60-1.90	0.06-2.0	0.08-0.15	4.5-6.0	<2	Low--------	0.28			
5----------------- Immokalee	0-9	1-5	1.20-1.50	6.0-20	0.05-0.10	3.6-6.0	<2	Low--------	0.10	5	1	1-2
	9-38	1-5	1.45-1.70	6.0-20	0.02-0.05	3.6-6.0	<2	Low--------	0.10			
	38-43	2-7	1.30-1.70	0.6-2.0	0.10-0.25	3.6-6.0	<2	Low--------	0.15			
	43-80	1-5	1.40-1.70	6.0-20	0.02-0.05	3.6-6.0	<2	Low--------	0.10			
6----------------- Candler	0-6	<3	1.35-1.60	6.0-20	0.04-0.08	4.5-6.0	<2	Low--------	0.10	5	1	.5-2
	6-60	<3	1.50-1.65	6.0-20	0.02-0.06	4.5-6.0	<2	Low--------	0.10			
	60-80	3-8	1.50-1.65	6.0-20	0.05-0.08	4.5-6.0	<2	Low--------	0.10			
7:												
Candler----------	0-8	<3	1.35-1.60	6.0-20	0.04-0.08	4.5-6.0	<2	Low--------	0.10	5	1	.5-2
	8-52	<3	1.50-1.65	6.0-20	0.02-0.06	4.5-6.0	<2	Low--------	0.10			
	52-80	3-8	1.50-1.65	6.0-20	0.05-0.08	4.5-6.0	<2	Low--------	0.10			
Apopka-----------	0-71	<3	1.45-1.60	6.0-20	0.03-0.05	4.5-7.3	<2	Low--------	0.10	5	1	<2
	71-80	18-34	1.55-1.75	0.6-2.0	0.12-0.17	4.5-6.0	<2	Low--------	0.24			
8----------------- Smyrna	0-19	1-6	1.35-1.50	6.0-20	0.03-0.07	3.6-7.3	<2	Low--------	0.10	5	1	1-5
	19-23	3-8	1.30-1.45	0.6-6.0	0.10-0.20	3.6-7.3	<2	Low--------	0.15			
	23-80	<6	1.45-1.70	6.0-20	0.03-0.07	4.5-5.5	<2	Low--------	0.10			
9----------------- Pomona	0-4	1-6	1.10-1.50	>6.0	0.05-0.10	3.6-6.5	<2	Low--------	0.10	5	1	1-4
	4-23	1-6	1.45-1.70	6.0-20	0.03-0.08	3.6-6.5	<2	Low--------	0.10			
	23-30	2-7	1.30-1.60	0.6-6.0	0.10-0.20	3.6-6.0	<2	Low--------	0.15			
	30-61	1-6	1.40-1.65	2.0-20	0.03-0.15	3.6-6.0	<2	Low--------	0.10			
	61-80	13-36	1.50-1.80	0.2-2.0	0.10-0.17	3.6-6.0	<2	Low--------	0.20			
10---------------- Placid	0-19	<10	1.20-1.40	6.0-20	0.15-0.20	3.6-5.5	<2	Low--------	0.10	5	1	2-10
	19-80	<10	1.30-1.60	6.0-20	0.05-0.08	3.6-6.5	<2	Low--------	0.10			
11:												
Placid-----------	0-14	<10	1.20-1.40	6.0-20	0.15-0.20	3.6-5.5	<2	Low--------	0.10	5	8	2-10
	14-80	<10	1.30-1.60	6.0-20	0.05-0.08	3.6-5.5	<2	Low--------	0.10			
Samsula----------	0-47	---	0.10-0.50	6.0-20	0.20-0.25	<4.5	<2	Low--------	----	2	8	>20
	47-80	1-14	1.35-1.55	6.0-20	0.02-0.05	3.6-5.0	<2	Low--------	0.17			
12:												
Otela------------	0-50	0-5	1.45-1.70	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10	5	1	<2
	50-68	8-35	1.55-1.75	0.06-0.6	0.06-0.15	3.6-7.8	<2	Low--------	0.20			
	68-80	30-65	1.55-1.75	0.06-0.6	0.08-0.18	3.6-8.4	<2	Moderate	0.24			
Candler----------	0-7	<3	1.35-1.60	6.0-20	0.04-0.08	4.5-6.0	<2	Low--------	0.10	5	1	.5-2
	7-75	<3	1.50-1.65	6.0-20	0.02-0.06	4.5-6.0	<2	Low--------	0.10			
	75-80	3-8	1.50-1.65	6.0-20	0.05-0.08	4.5-6.0	<2	Low--------	0.10			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
13-----------Wekiva	0-4	2-6	1.30-1.50	6.0-20	0.05-0.15	6.1-7.3	<2	Low--------	0.10	2	1	2-5
	4-9	1-6	1.45-1.60	6.0-20	0.05-0.10	6.1-7.3	<2	Low--------	0.10			
	9-18	12-35	1.45-1.65	0.2-0.6	0.10-0.15	6.1-7.3	<2	Low--------	0.15			
	18	---	---	---	---	---	---	----------	----			
14:												
Shadeville------	0-8	2-10	1.40-1.60	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10	4	1	.5-2
	8-35	1-10	1.45-1.70	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10			
	35-60	14-35	1.45-1.70	0.6-2.0	0.10-0.15	4.5-8.4	<2	Low--------	0.20			
	60-64	18-55	1.60-1.75	0.06-0.2	0.10-0.15	4.5-8.4	<2	Moderate	0.24			
	64	---	---	---	---	---	---	----------	----			
Otela-----------	0-60	0-5	1.45-1.65	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10	5	1	<2
	60-80	8-35	1.55-1.75	0.06-0.6	0.06-0.15	3.6-7.8	<2	Low--------	0.20			
15:												
Holopaw---------	0-60	2-5	1.20-1.60	6.0-20	0.03-0.07	5.1-7.3	<2	Low--------	0.10	5	8	1-4
	60-80	16-24	1.50-1.70	0.6-2.0	0.10-0.15	5.1-8.4	<2	Low--------	0.24			
Pineda----------	0-35	1-8	1.30-1.60	6.0-20.0	0.02-0.05	4.5-7.3	<2	Low--------	0.10	5	8	.5-6
	35-52	10-25	1.50-1.70	<0.2	0.10-0.15	5.1-8.4	<2	Low--------	0.24			
	52-80	3-12	1.45-1.60	2.0-6.0	0.02-0.05	5.6-8.4	<2	Low--------	0.10			
16:												
Chobee----------	0-19	7-20	1.45-1.50	2.0-6.0	0.10-0.15	6.1-7.8	<2	Low--------	0.15	5	8	2-7
	19-42	20-35	1.55-1.75	<0.2	0.12-0.17	7.4-8.4	<2	Moderate	0.32			
	42-80	7-20	1.60-1.75	0.2-6.0	0.06-0.10	7.4-8.4	<2	Low--------	0.20			
Gator-----------	0-26	---	0.20-0.30	6.0-20	0.30-0.40	>4.5	<2	Low--------	----	2	8	55-80
	26-52	14-35	1.60-1.70	0.6-2.0	0.10-0.15	6.1-8.4	<2	Low--------	0.32			
	52-80	2-7	1.40-1.65	6.0-20	0.03-0.05	6.1-8.4	<2	Low--------	0.15			
17-----------Adamsville	0-14	1-8	1.35-1.65	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10	5	1	<2
	14-80	1-7	1.35-1.65	6.0-20	0.03-0.08	4.5-7.3	<2	Low--------	0.10			
18-----------Wauchula	0-4	<2	1.25-1.45	2.0-20	0.08-0.15	3.6-5.5	<2	Low--------	0.10	5	1	1-3
	4-18	<2	1.45-1.60	6.0-20	0.02-0.10	3.6-5.5	<2	Low--------	0.10			
	18-27	2-8	1.45-1.60	0.2-6.0	0.15-0.25	3.6-5.5	<2	Low--------	0.15			
	27-32	<5	1.45-1.65	2.0-6.0	0.08-0.15	4.5-5.5	<2	Low--------	0.10			
	32-61	15-30	1.40-1.80	0.06-0.2	0.10-0.17	4.5-5.5	<2	Low--------	0.20			
	61-80	10-20	1.60-1.75	0.06-0.6	0.15-0.20	4.5-5.5	<2	Low--------	0.15			
19-----------Sparr	0-6	1-5	1.20-1.50	6.0-20	0.08-0.12	3.6-6.5	<2	Low--------	0.10	5	1	<3
	6-54	1-5	1.45-1.70	6.0-20	0.05-0.08	3.6-6.5	<2	Low--------	0.10			
	54-80	12-35	1.55-1.80	0.06-0.6	0.10-0.18	3.6-6.5	<2	Low--------	0.24			
21-----------Pompano	0-80	0-5	1.30-1.65	6.0-20	0.02-0.05	4.5-7.8	<2	Low--------	0.10	5	1	4
22-----------Holopaw	0-54	1-7	1.35-1.60	6.0-20	0.07-0.10	5.1-7.3	<2	Low--------	0.10	5	1	1-4
	54-80	13-28	1.60-1.70	0.2-2.0	0.15-0.20	5.1-8.4	<2	Low--------	0.20			
23-----------Zolfo	0-4	1-5	1.35-1.55	6.0-20	0.10-0.15	4.5-7.3	<2	Low--------	0.10	5	1	.5-1
	4-71	1-5	1.30-1.60	6.0-20	0.03-0.10	4.5-7.3	<2	Low--------	0.10			
	71-80	1-5	1.50-1.70	0.6-2.0	0.10-0.25	3.6-6.5	<2	Low--------	0.15			
24-----------Terra Ceia	0-59	---	0.15-0.35	6.0-20	0.30-0.50	>4.5	<2	Low--------	----	2	8	60-90
	59-80	2-10	1.35-1.50	6.0-20	0.02-0.08	>4.5	<2	Low--------	----			
25: Pits.												

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
25:												
Dumps.												
26:												
Gator-----------	0-38	---	0.20-0.30	6.0-20	0.30-0.40	>4.5	<2	Low--------	----	2	8	55-80
	38-80	14-35	1.60-1.70	0.6-2.0	0.10-0.15	6.1-8.4	<2	Low--------	0.32			
Terra Ceia------	0-80	---	0.15-0.35	6.0-20	0.30-0.50	>4.5	<2	Low--------	----	2	8	>60
27:												
Placid----------	0-22	<10	1.20-1.40	6.0-20	0.15-0.20	3.6-5.5	<2	Low--------	0.10	5	8	2-10
	22-80	<10	1.30-1.60	6.0-20	0.05-0.08	3.6-5.5	<2	Low--------	0.10			
Popash----------	0-12	3-13	1.25-1.45	6.0-20	0.15-0.25	3.6-6.5	<2	Low--------	0.10	5	8	6-12
	12-45	1-7	1.50-1.65	6.0-20	0.05-0.08	5.6-7.3	<2	Low--------	0.10			
	45-80	13-30	1.45-1.60	<0.2	0.10-0.15	5.6-7.3	<2	Low--------	0.24			
29:												
Chobee----------	0-11	7-20	1.45-1.50	2.0-6.0	0.10-0.15	6.1-7.8	<2	Low--------	0.15	5	3	2-7
	11-48	20-35	1.55-1.75	<0.2	0.12-0.17	6.1-8.4	<2	Moderate	0.32			
	48-80	7-20	1.60-1.75	0.2-6.0	0.06-0.10	6.1-8.4	<2	Low--------	0.20			
Bradenton-------	0-4	1-6	1.30-1.50	6.0-20	0.08-0.12	5.1-7.3	<2	Low--------	0.10	5	1	2-8
	4-9	1-6	1.50-1.70	6.0-20	0.03-0.07	5.1-7.3	<2	Low--------	0.20			
	9-28	10-18	1.55-1.70	0.6-2.0	0.10-0.15	6.1-8.4	<2	Low--------	0.24			
	28-80	1-18	1.55-1.70	0.6-6.0	0.03-0.10	6.1-8.4	<2	Low--------	0.24			
31:												
Jonesville------	0-5	3-5	1.35-1.50	6.0-20	0.05-0.10	5.1-6.5	<2	Low--------	0.10	3	1	.5-2
	5-27	0-2	1.45-1.60	6.0-20	0.02-0.08	5.1-6.5	<2	Low--------	0.10			
	27-35	15-35	1.50-1.70	0.2-2.0	0.05-0.10	6.6-8.4	<2	Low--------	0.20			
	35	---	---	---	---	---	---	-----------	----			
Otela-----------	0-58	2-5	1.45-1.65	6.0-20.0	0.05-0.10	4.5-6.0	<2	Low--------	0.10	5	1	.5-2
	58-66	15-32	1.55-1.75	0.6-2.0	0.06-0.15	4.5-8.4	<2	Low--------	0.24			
	66	---	---	---	---	---	---	-----------	----			
Seaboard--------	0-8	2-3	1.20-1.40	6.0-20	0.05-0.09	5.1-6.0	<2	Low--------	0.10	2	1	.5-2
	8-17	3-5	1.50-1.60	6.0-20	0.05-0.08	5.6-7.3	<2	Low--------	0.10			
	17	---	---	---	---	---	---	-----------	----			
32:												
Otela-----------	0-68	0-5	1.45-1.70	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10	5	1	<2
	68-80	8-35	1.55-1.75	0.06-0.6	0.06-0.15	3.6-7.8	<2	Low--------	0.20			
Tavares---------	0-9	0-4	1.25-1.65	>6.0	0.05-0.10	3.6-6.0	<2	Low--------	0.10	5	1	.5-2
	9-80	0-4	1.40-1.70	>6.0	0.02-0.05	3.6-6.0	<2	Low--------	0.10			
33--------------- Wulfert	0-30	---	0.20-0.40	6.0-20	0.20-0.25	5.6-7.3	>16	-----------	----	2	8	20-74
	30-80	2-5	1.50-1.60	6.0-20	0.02-0.08	5.6-7.3	>16	Low--------	0.17			
34:												
Cassia----------	0-24	1-4	1.30-1.55	6.0-20	0.03-0.07	4.5-6.5	<2	Low--------	0.10	5	1	<1
	24-55	2-10	1.30-1.55	0.6-6.0	0.10-0.15	4.5-6.5	<2	Low--------	0.15			
	55-80	1-5	1.40-1.60	6.0-20	0.03-0.07	4.5-6.5	<2	Low--------	0.10			
Pomello---------	0-40	<2	1.35-1.65	>20	0.02-0.05	4.5-6.0	<2	Low--------	0.10	5	1	<1
	40-80	<2	1.45-1.60	2.0-6.0	0.10-0.30	4.5-6.0	<2	Low--------	0.15			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
35--------------- Pineda	0-25	1-3	1.40-1.65	6.0-20	0.02-0.05	5.6-6.5	<2	Low--------	0.15	5	1	1-2
	25-50	12-35	1.65-1.75	0.06-0.2	0.10-0.15	6.6-7.8	<2	Low--------	0.24			
	50	---	---	---	---	---	---	-----------	----			
37--------------- Myakka	0-8	2-8	1.15-1.30	6.0-20.0	0.15-0.20	3.6-6.5	<2	Low--------	0.10	5	1	10-20
	8-21	1-6	1.30-1.65	6.0-20.0	0.02-0.05	3.6-6.5	<2	Low--------	0.10			
	21-40	2-8	1.35-1.70	0.6-6.0	0.10-0.20	3.6-6.5	<2	Low--------	0.15			
	40-80	1-6	1.40-1.65	0.6-20.0	0.02-0.20	3.6-6.5	<2	Low--------	0.10			
38--------------- Myakka	0-5	1-3	1.25-1.45	6.0-20	0.05-0.15	3.6-6.5	<2	Low--------	0.10	5	1	2-5
	5-26	0-2	1.45-1.60	6.0-20	0.02-0.05	3.6-6.5	<2	Low--------	0.10			
	26-58	1-8	1.45-1.60	0.6-6.0	0.10-0.20	3.6-6.5	<2	Low--------	0.15			
	58-80	0-2	1.48-1.70	6.0-20	0.02-0.10	3.6-6.5	<2	Low--------	0.10			
39:												
Waccasassa------	0-2	12-35	1.05-1.25	0.2-0.6	0.12-0.18	5.6-7.3	<2	Low--------	0.15	1	8	2-10
	2-12	12-35	1.20-1.45	0.2-0.6	0.10-0.15	5.6-7.3	<2	Low--------	0.15			
	12	---	---	---	---	---	---	-----------	----			
Demory----------	0-6	8-25	1.05-1.45	0.2-2.0	0.08-0.15	6.1-7.3	<2	Low--------	0.10	1	8	6-18
	6-11	12-35	1.20-1.45	0.2-0.6	0.10-0.15	6.1-7.3	<2	Low--------	0.15			
	11	---	---	---	---	---	---	-----------	----			
40--------------- Pineda	0-4	1-6	1.25-1.60	6.0-20	0.05-0.10	4.5-6.5	<2	Low--------	0.10	5	1	.5-6
	4-32	1-8	1.40-1.70	6.0-20	0.02-0.05	4.5-7.3	<2	Low--------	0.10			
	32-80	10-25	1.50-1.70	<0.2	0.10-0.15	5.1-8.4	<2	Low--------	0.24			
41--------------- Demory	0-3	---	0.15-0.70	>20	0.30-0.50	6.1-7.3	<2	Low--------	----	1	8	22-35
	3-9	12-35	1.20-1.45	0.2-0.6	0.10-0.15	6.1-7.3	<2	Low--------	0.15			
	9	---	---	---	---	---	---	-----------	----			
42:												
Ousley----------	0-12	1-3	1.35-1.45	6.0-20	0.05-0.10	4.5-6.0	<2	Low--------	0.10	5	1	<.5
	12-80	1-2	1.45-1.60	6.0-20	0.02-0.06	4.5-6.0	<2	Low--------	0.15			
Albany----------	0-50	1-10	1.40-1.55	6.0-20	0.02-0.04	4.5-6.0	<2	Low--------	0.10	5	1	1-2
	50-80	13-35	1.55-1.65	0.6-2.0	0.10-0.16	4.5-6.0	<2	Low--------	0.24			
43--------------- Tidewater	0-24	20-65	0.20-1.20	0.2-0.6	0.09-0.12	6.1-7.3	>16	High-------	0.20	5	8	10-30
	24-40	18-35	0.90-1.35	0.6-2.0	0.08-0.09	6.1-7.3	>16	Moderate	0.20			
	40-76	---	---	---	---	---	<2	-----------	----			
	76	---	---	---	---	---	---	-----------	----			
45--------------- Cracker	0-4	20-65	0.20-1.20	0.2-0.6	0.09-0.12	6.1-7.3	>16	High-------	0.20	1	8	10-30
	4-12	14-35	0.90-1.35	0.6-2.0	0.08-0.09	6.1-7.3	>16	Moderate	0.20			
	12	---	---	---	---	---	---	-----------	----			
46--------------- Chobee	0-11	7-20	1.45-1.50	2.0-6.0	0.10-0.15	5.6-7.3	<2	Low--------	0.15	3	3	2-15
	11-68	18-35	1.50-1.70	0.06-0.2	0.12-0.17	6.1-8.4	<2	Moderate	0.32			
	68	---	---	---	---	---	---	-----------	----			
48:												
Lutterloh-------	0-7	1-5	1.35-1.55	6.0-20	0.05-0.10	4.5-6.0	<2	Low--------	0.10	5	1	.5-3
	7-57	0-5	1.45-1.65	6.0-20	0.02-0.05	4.5-6.0	<2	Low--------	0.10			
	57-69	15-30	1.60-1.70	0.6-2.0	0.10-0.15	4.5-7.3	<2	Low--------	0.24			
	69-80	30-55	1.60-1.70	0.06-0.2	0.10-0.15	4.5-7.3	<2	High-------	0.32			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
48:												
Moriah----------	0-8	1-5	1.35-1.50	6.0-20	0.05-0.10	3.6-5.5	<2	Low-------	0.10	3	1	1-4
	8-35	1-3	1.45-1.65	6.0-20	0.02-0.05	3.6-5.5	<2	Low-------	0.10			
	35-39	18-35	1.60-1.85	0.6-2.0	0.10-0.15	4.5-7.3	<2	Low-------	0.20			
	39-51	35-60	1.40-1.65	0.06-0.2	0.10-0.20	4.5-7.3	<2	Moderate	0.32			
	51	---	---	---	---	---	---	----------	----			
49--------------- Hicoria	0-17	1-4	1.40-1.60	6.0-20	0.05-0.10	3.6-6.5	<2	Low-------	0.10	5	1	2-9
	17-23	1-7	1.55-1.70	6.0-20	0.05-0.10	3.6-7.3	<2	Low-------	0.10			
	23-80	13-30	1.45-1.85	0.06-0.6	0.10-0.20	3.6-7.3	<2	Low-------	0.24			
50--------------- Hicoria	0-15	2-13	1.40-1.60	6.0-20	0.10-0.15	3.6-6.5	<2	Low-------	0.10	5	8	2-9
	15-38	1-7	1.55-1.80	6.0-20	0.05-0.10	3.6-7.3	<2	Low-------	0.10			
	38-80	13-30	1.45-1.85	0.06-0.6	0.10-0.20	3.6-7.3	<2	Low-------	0.24			
51:												
Ft. Green-------	0-7	2-5	1.25-1.55	6.0-20	0.10-0.15	3.6-6.5	<2	Low-------	0.10	5	1	1-6
	7-33	2-8	1.45-1.65	6.0-20	0.05-0.10	4.5-6.5	<2	Low-------	0.10			
	33-80	13-34	1.50-1.80	0.06-0.6	0.12-0.18	4.5-6.5	<2	Low-------	0.24			
Bivans----------	0-17	1-7	1.05-1.55	0.6-6.0	0.10-0.15	3.6-6.0	<2	Low-------	0.10	5	1	1-4
	17-70	25-48	1.25-1.85	<0.2	0.05-0.15	3.6-6.0	<2	High------	0.20			
	70-80	29-60	1.30-1.90	<0.2	0.05-0.15	3.6-6.0	<2	High------	0.20			
55:												
Pedro-----------	0-11	1-5	1.36-1.65	6.0-20	0.03-0.08	5.1-6.5	<2	Low-------	0.10	3	1	.5-2
	11-15	12-35	1.55-1.70	2.0-6.0	0.10-0.15	6.1-7.8	<2	Low-------	0.20			
	15-21	---	---	---	---	---	---	----------	----			
	21	---	---	---	---	---	---	----------	----			
Jonesville------	0-9	3-5	1.35-1.50	6.0-20	0.05-0.10	5.1-6.5	<2	Low-------	0.10	3	1	.5-2
	9-31	0-2	1.45-1.62	6.0-20	0.02-0.08	5.1-6.5	<2	Low-------	0.10			
	31-35	15-35	1.50-1.70	0.2-2.0	0.05-0.10	6.6-8.4	<2	Low-------	0.20			
	35	---	---	---	---	---	---	----------	----			
Shadeville------	0-10	2-10	1.40-1.60	6.0-20	0.05-0.10	4.5-7.3	<2	Low-------	0.10	4	1	.5-2
	10-23	2-10	1.45-1.70	6.0-20	0.05-0.10	4.5-7.3	<2	Low-------	0.10			
	23-45	14-35	1.45-1.70	0.6-2.0	0.10-0.15	4.5-8.4	<2	Low-------	0.20			
	45	---	---	---	---	---	---	----------	----			
56:												
Moriah----------	0-9	1-5	1.35-1.50	6.0-20	0.05-0.10	3.6-5.5	<2	Low-------	0.10	3	1	1-4
	9-28	1-3	1.45-1.65	6.0-20	0.02-0.05	3.6-5.5	<2	Low-------	0.10			
	28-52	18-35	1.60-1.85	0.6-2.0	0.10-0.15	4.5-7.3	<2	Low-------	0.20			
	52-68	35-60	1.40-1.65	0.06-0.2	0.10-0.20	4.5-7.3	<2	Moderate	0.32			
	68	---	---	---	---	---	---	----------	----			
Bushnell--------	0-6	2-8	1.35-1.55	2.0-20	0.10-0.15	4.5-6.5	<2	Low-------	0.10	3	1	1-4
	6-10	2-8	1.55-1.70	2.0-20	0.05-0.10	4.5-6.5	<2	Low-------	0.10			
	10-16	20-40	1.60-1.70	0.06-0.2	0.10-0.20	4.5-7.3	<2	Moderate	0.24			
	16-26	35-60	1.40-1.60	0.06-0.2	0.10-0.15	4.5-8.4	<2	High------	0.28			
	26	---	---	---	---	---	---	----------	----			
Mabel-----------	0-7	2-8	1.30-1.55	2.0-20	0.10-0.15	4.5-7.3	<2	Low-------	0.10	4	1	1-4
	7-14	2-8	1.55-1.70	2.0-20	0.05-0.10	4.5-7.3	<2	Low-------	0.10			
	14-18	20-40	1.40-1.70	0.06-0.2	0.10-0.20	4.5-7.3	<2	Moderate	0.24			
	18-31	40-60	1.35-1.60	0.06-0.2	0.10-0.15	4.5-8.4	<2	High------	0.28			
	31-53	50-75	1.10-1.60	0.06-0.2	0.10-0.15	4.5-8.4	<2	High------	0.28			
	53	---	---	---	---	---	---	----------	----			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
57------------ Paola	0-2	0-2	1.20-1.45	>20	0.02-0.05	3.6-7.3	<2	Low--------	0.10	5	1	<.5
	2-11	0-2	1.45-1.60	>20	0.02-0.05	3.6-7.3	<2	Low--------	0.10			
	11-80	0-3	1.45-1.60	>20	0.02-0.05	3.6-7.3	<2	Low--------	0.10			
58:												
Boca------------	0-5	1-5	1.30-1.55	6.0-20	0.05-0.10	5.1-8.4	<2	Low--------	0.10	3	1	1-3
	5-29	1-5	1.50-1.60	6.0-20	0.02-0.05	5.1-8.4	<2	Low--------	0.17			
	29-37	14-30	1.55-1.65	0.6-2.0	0.10-0.15	5.1-8.4	<2	Low--------	0.20			
	37	---	---	---	---	---	---	-----------	----			
Holopaw---------	0-43	1-7	1.35-1.60	6.0-20	0.07-0.10	5.1-8.4	<2	Low--------	0.10	5	1	1-4
	43-65	13-28	1.60-1.70	0.2-2.0	0.15-0.20	5.1-8.4	<2	Low--------	0.20			
	65	---	---	---	---	---	---	-----------	----			
59:												
Aripeka---------	0-6	2-9	1.30-1.50	6.0-20	0.10-0.15	4.5-7.3	<2	Low--------	0.15	2	1	2-5
	6-12	1-6	1.45-1.60	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.15			
	12-24	15-35	1.50-1.60	0.2-0.6	0.10-0.20	6.1-7.8	<2	Low--------	0.20			
	24	---	---	---	---	---	---	-----------	----			
Matmon----------	0-6	1-6	1.35-1.60	6.0-20	0.05-0.10	5.1-7.3	<2	Low--------	0.15	2	1	2-5
	6-15	12-35	1.30-1.65	0.2-0.6	0.10-0.15	6.1-7.8	<2	Low--------	0.10			
	15	---	---	---	---	---	---	-----------	----			
60:												
EauGallie-------	0-16	<5	1.25-1.50	6.0-20	0.02-0.05	4.5-6.0	<2	Low--------	0.10	5	1	2-8
	16-19	1-8	1.45-1.60	0.6-6.0	0.10-0.15	4.5-6.5	<2	Low--------	0.15			
	19-55	1-5	1.45-1.65	6.0-20	0.02-0.05	5.1-7.8	<2	Low--------	0.10			
	55-61	13-31	1.55-1.70	0.2-2.0	0.10-0.15	5.1-7.8	<2	Low--------	0.20			
	61	---	---	---	---	---	---	-----------	----			
Holopaw---------	0-42	1-7	1.35-1.60	6.0-20	0.07-0.10	5.1-8.4	<2	Low--------	0.10	5	1	1-4
	42-52	13-28	1.60-1.70	0.2-2.0	0.15-0.20	5.1-8.4	<2	Low--------	0.20			
	52	---	---	---	---	---	---	-----------	----			
62:												
Millhopper------	0-74	2-8	1.30-1.65	6.0-20	0.05-0.10	4.5-6.5	<2	Low--------	0.10	5	1	.5-2
	74-80	12-28	1.60-1.90	0.06-2.0	0.08-0.15	4.5-6.0	<2	Low--------	0.28			
Bonneau---------	0-29	1-7	1.25-1.50	6.0-20	0.05-0.07	4.5-6.0	<2	Low--------	0.10	5	1	<2
	29-60	15-25	1.55-1.70	0.6-6.0	0.10-0.15	4.5-6.0	<2	Low--------	0.24			
	60-80	15-25	1.55-1.75	0.06-2.0	0.12-0.15	4.5-6.0	<2	Low--------	0.32			
65:												
Sparr-----------	0-8	1-5	1.20-1.50	6.0-20	0.08-0.12	3.6-6.5	<2	Low--------	0.10	5	1	<3
	8-50	1-5	1.45-1.70	6.0-20	0.05-0.08	3.6-6.5	<2	Low--------	0.10			
	50-80	12-34	1.55-1.80	0.06-0.6	0.10-0.18	3.6-6.5	<2	Low--------	0.24			
Lochloosa-------	0-38	2-12	1.35-1.65	2.0-20	0.05-0.20	4.5-5.5	<2	Low--------	0.10	5	1	1-4
	38-66	15-35	1.55-1.70	0.6-0.2	0.12-0.15	4.5-5.5	<2	Low--------	0.28			
	66-80	15-35	1.55-1.70	0.06-0.2	0.10-0.15	4.5-5.5	<2	Low--------	0.28			
66:												
Levyville-------	0-8	6-12	1.30-1.60	2.0-20	0.05-0.10	4.5-6.0	<2	Low--------	0.15	5	2	1-4
	8-80	18-34	1.45-1.75	0.6-2.0	0.10-0.15	4.5-6.0	<2	Low--------	0.20			
Shadeville------	0-9	2-10	1.40-1.60	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10	4	1	.5-2
	9-26	1-10	1.45-1.70	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10			
	26-41	14-35	1.45-1.70	0.6-2.0	0.10-0.15	4.5-8.4	<2	Low--------	0.20			
	41-63	18-55	1.60-1.75	0.06-0.2	0.10-0.15	4.5-8.4	<2	Moderate	0.24			
	63	---	---	---	---	---	---	-----------	----			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
67:												
Immokalee-------	0-4	1-5	1.20-1.50	>6.0	0.05-0.10	5.1-7.8	<2	Low--------	0.10	5	1	1-2
	4-41	1-5	1.40-1.70	>6.0	0.02-0.05	5.1-7.8	<2	Low--------	0.10			
	41-49	2-7	1.30-1.60	0.6-6.0	0.10-0.25	5.1-7.8	<2	Low--------	0.15			
	49	---	---	---	---	---	---	-----------	----			
Janney----------	0-8	1-5	1.25-1.45	6.0-20	0.05-0.10	3.6-6.5	<2	Low--------	0.10	3	1	1-4
	8-20	1-5	1.45-1.65	6.0-20	0.02-0.05	3.6-6.5	<2	Low--------	0.10			
	20-27	1-12	1.50-1.70	0.6-2.0	0.10-0.15	4.5-7.3	<2	Low--------	0.15			
	27	---	---	---	---	---	<2	-----------	----			
68:												
Myakka----------	0-24	0-2	1.35-1.55	6.0-20	0.02-0.05	5.1-7.8	<2	Low--------	0.10	4	1	<2
	24-40	1-8	1.45-1.60	0.6-6.0	0.10-0.20	5.1-7.8	<2	Low--------	0.15			
	40-54	0-2	1.48-1.70	6.0-20	0.10-0.20	5.1-7.8	<2	Low--------	0.10			
	54	---	---	---	---	---	---	-----------	----			
Immokalee-------	0-6	1-5	1.20-1.50	6.0-20	0.05-0.10	3.6-6.0	<2	Low--------	0.10	5	1	1-2
	6-37	1-5	1.45-1.70	6.0-20	0.02-0.05	3.6-6.0	<2	Low--------	0.10			
	37-70	2-7	1.30-1.70	0.6-2.0	0.10-0.25	3.6-6.0	<2	Low--------	0.15			
	70-80	1-5	1.40-1.70	6.0-20	0.02-0.05	3.6-6.0	<2	Low--------	0.10			
69:												
Broward---------	0-6	2-8	1.35-1.45	6.0-20	0.05-0.10	5.6-8.4	<2	Low--------	0.10	3	1	<1
	6-25	1-7	1.50-1.60	6.0-20	0.03-0.08	5.6-8.4	<2	Low--------	0.10			
	25	---	---	---	---	---	---	-----------	----			
Lutterloh-------	0-52	0-5	1.45-1.65	6.0-20	0.02-0.05	5.1-6.0	<2	Low--------	0.10	5	1	<3
	52-61	15-30	1.60-1.75	0.6-2.0	0.10-0.15	5.1-6.0	<2	Low--------	0.24			
	61	---	---	---	---	---	---	-----------	----			
70:												
Hallandale------	0-4	0-3	1.20-1.45	6.0-20	0.05-0.10	5.1-6.5	<2	Low--------	0.10	1	1	1-2
	4-19	0-5	1.45-1.65	6.0-20	0.03-0.10	5.6-8.4	<2	Low--------	0.10			
	19	---	---	---	---	---	---	-----------	----			
Boca------------	0-4	1-5	1.30-1.55	6.0-20	0.05-0.10	5.1-8.4	<2	Low--------	0.10	2	1	1-3
	4-21	1-5	1.50-1.60	6.0-20	0.02-0.05	5.1-8.4	<2	Low--------	0.17			
	21-25	14-30	1.55-1.65	0.6-2.0	0.10-0.15	5.1-8.4	<2	Low--------	0.20			
	25	---	---	---	---	---	---	-----------	----			
Holopaw---------	0-52	1-7	1.35-1.60	6.0-20	0.07-0.10	5.1-7.3	<2	Low--------	0.10	5	1	1-4
	52-80	13-28	1.60-1.70	0.2-2.0	0.15-0.20	5.1-8.4	<2	Low--------	0.20			
71--------------- Pender	0-14	3-10	1.50-1.70	6.0-20	0.05-0.09	4.5-6.5	<2	Low--------	0.49	5	2	.5-2
	14-58	20-35	1.30-1.60	0.6-2.0	0.10-0.15	5.6-7.8	<2	Low--------	0.24			
	58-80	---	---	---	---	---	---	-----------	----			
72:												
Levyville-------	0-15	6-12	1.30-1.60	2.0-20	0.05-0.10	4.5-6.0	<2	Low--------	0.15	5	1	1-4
	15-55	18-34	1.45-1.75	0.6-2.0	0.10-0.15	4.5-6.0	<2	Low--------	0.20			
	55-80	---	---	0.06-20	---	---	<2	-----------	----			
Hague-----------	0-24	1-7	1.25-1.50	6.0-20	0.05-0.08	4.5-6.0	<2	Low--------	0.10	5	1	0-2
	24-50	15-30	1.55-1.70	0.6-2.0	0.12-0.17	4.5-6.0	<2	Low--------	0.24			
	50-80	10-15	1.50-1.70	2.0-6.0	0.06-0.10	4.5-6.0	<2	Low--------	0.15			
73--------------- Orlando	0-11	1-8	1.35-1.45	6.0-20	0.07-0.12	4.5-6.5	<2	Low--------	0.10	5	1	1-5
	11-80	2-8	1.40-1.60	6.0-20	0.03-0.06	4.5-6.0	<2	Low--------	0.10			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
74. Arents												
75: Orlando	0-11	1-8	1.35-1.45	6.0-20	0.07-0.12	4.5-6.5	<2	Low	0.10	5	1	1-5
	11-80	1-8	1.40-1.60	6.0-20	0.03-0.06	4.5-6.0	<2	Low	0.10			
76: Astatula	0-5	<-3	1.25-1.55	>20	0.04-0.10	4.5-6.5	<2	Low	0.10	5	1	.5-2
	5-80	<-3	1.45-1.60	>20	0.02-0.05	4.5-6.5	<2	Low	0.10			
77: Candler	0-6	<3	1.35-1.60	6.0-20	0.04-0.08	4.5-6.0	<2	Low	0.10	5	1	.5-2
	6-60	<3	1.50-1.65	6.0-20	0.02-0.06	4.5-6.0	<2	Low	0.10			
	60-80	3-8	1.50-1.65	6.0-20	0.05-0.08	4.5-6.0	<2	Low	0.10			
78: Micanopy	0-7	3-12	1.50-1.65	6.0-20	0.05-0.10	3.6-6.0	<2	Low	0.15	5	2	1-5
	7-15	20-38	1.50-1.65	0.6-2.0	0.10-0.15	3.6-6.0	<2	Moderate	0.32			
	15-21	36-50	1.40-1.70	0.06-0.2	0.10-0.18	3.6-6.0	<2	High	0.28			
	21-56	40-60	1.35-1.65	0.06-0.2	0.10-0.18	3.6-6.0	<2	High	0.28			
	56-80	25-50	1.55-1.70	0.06-0.2	0.10-0.15	3.6-6.0	<2	High	0.32			

TABLE 16.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding		High water table		Depth to bedrock	Risk of corrosion	
		Frequency	Duration	Depth	Kind		Uncoated steel	Concrete
				Ft		In		
2----------------- Tavares	A	None--------	---	4.0-6.0	Apparent	>60	Low------	High.
3----------------- Orsino	A	None--------	---	4.0-5.0	Apparent	>60	Low------	Moderate.
4----------------- Millhopper	A	None--------	---	4.0-6.0	Perched	>60	Low------	Moderate.
5----------------- Immokalee	B/D	None--------	---	0.5-1.5	Apparent	>60	High-----	High.
6----------------- Candler	A	None--------	---	>6.0	---	>60	Low------	High.
7:								
Candler----------	A	None--------	---	>6.0	---	>60	Low------	High.
Apopka-----------	A	None--------	---	>6.0	---	>60	Moderate	High.
8----------------- Smyrna	B/D	None--------	---	0.5-1.5	Apparent	>60	High-----	High.
9----------------- Pomona	B/D	None--------	---	0.5-1.5	Apparent	>60	High-----	High.
10---------------- Placid	B/D	None--------	---	0-1.0	Apparent	>60	High-----	High.
11:								
Placid-----------	D	None--------	---	+2-0	Apparent	>60	High-----	High.
Samsula----------	B/D	None--------	---	+2-0	Apparent	>60	High-----	High.
12:								
Otela------------	A	None--------	---	4.0-6.0	Perched	>60	Low------	Low.
Candler----------	A	None--------	---	>6.0	---	>60	Low------	High.
13---------------- Wekiva	D	None--------	---	0-1.0	Apparent	10-30	High-----	Low.
14:								
Shadeville-------	B	None--------	---	4.0-6.0	Perched	40-72	Low------	Moderate.
Otela------------	A	None--------	---	4.0-6.0	Perched	>60	Low------	Low.
15:								
Holopaw----------	D	Frequent----	Very long	0-1.0	Apparent	>60	High-----	High.
Pineda-----------	B/D	Frequent----	Very long	0-1.0	Apparent	>60	High-----	Low.
16:								
Chobee-----------	B/D	Frequent----	Very long	0-0.5	Apparent	>60	Moderate	Low.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	High water table: Depth	High water table: Kind	Depth to bedrock	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
				Ft		In		
16:								
Gator	D	Frequent	Very long	0-0.5	Apparent	>60	High	High.
17 Adamsville	C	None	---	2.0-3.5	Apparent	>60	Low	Moderate.
18 Wauchula	B/D	None	---	0.5-1.5	Apparent	>60	High	High.
19 Sparr	C	None	---	1.5-3.5	Apparent	>60	Moderate	High.
21 Pompano	B/D	None	---	0-0.5	Apparent	>60	High	Moderate.
22 Holopaw	B/D	None	---	0-1.0	Apparent	>60	High	Moderate.
23 Zolfo	C	None	---	2.0-3.5	Apparent	>60	Low	Moderate.
24 Terra Ceia	B/D	None	---	+2-0	Apparent	>60	Moderate	Moderate.
25:								
Pits.								
Dumps.								
26:								
Gator	D	Frequent	Very long	0-0.5	Apparent	>60	High	High.
Terra Ceia	D	Frequent	Very long	0-0.5	Apparent	>60	Moderate	Moderate.
27:								
Placid	D	None	---	+2-0	Apparent	>60	High	High.
Popash	D	None	---	+2-0	Apparent	>60	Moderate	Moderate.
29:								
Chobee	B/D	Frequent	Brief to very long.	0-0.5	Apparent	>60	Moderate	Low.
Bradenton	D	Frequent	Very long	0-1.0	Apparent	>60	High	Low.
31:								
Jonesville	B	None	---	>6.0	---	24-40	Low	Low.
Otela	A	None	---	4.0-6.0	Perched	>60	Low	Low.
Seaboard	B	None	---	3.5-5.0	Apparent	4-20	High	High.
32:								
Otela	A	None	---	4.0-6.0	Perched	>60	Low	Low.
Tavares	A	None	---	4.0-6.0	Apparent	>60	Low	High.
33 Wulfert	D	Frequent	Very long	0-0.5	Apparent	>60	High	High.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	High water table: Depth	High water table: Kind	Depth to bedrock	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
				Ft		In		
34:								
Cassia	C	None	---	1.5-3.5	Apparent	>60	Moderate	High.
Pomello	C	None	---	1.5-3.5	Apparent	>60	Low	High.
35 Pineda	B/D	None	---	0-1.0	Apparent	40-80	High	Low.
37 Myakka	B/D	Occasional	Brief	0-1.0	Apparent	>60	High	High.
38 Myakka	B/D	None	---	0.5-1.5	Apparent	>60	High	High.
39:								
Waccasassa	D	Rare	---	0-1.0	Apparent	6-20	High	Low.
Demory	D	Occasional	Brief	0-1.0	Apparent	4-20	High	Low.
40 Pineda	B/D	None	---	0-1.0	Apparent	>60	High	Low.
41 Demory	D	Occasional	Brief	0-1.0	Apparent	4-20	High	Low.
42:								
Ousley	C	Occasional	Brief	1.5-3.0	Apparent	>60	Low	High.
Albany	C	Occasional	Brief	1.0-2.5	Apparent	>60	High	High.
43 Tidewater	D	Frequent	Very long	0-1.0	Apparent	>40	High	High.
45 Cracker	D	Frequent	Very long	0-1.0	Apparent	6-20	High	High.
46 Chobee	D	Frequent	Very long	+2-0	Apparent	40-79	High	Low.
48:								
Lutterloh	C	None	---	1.5-3.5	Perched	>60	High	Moderate.
Moriah	C	None	---	1.5-3.5	Perched	40-72	High	High.
49 Hicoria	B/D	None	---	0-0.5	Apparent	>60	High	High.
50 Hicoria	D	None	---	+2-0	Apparent	>60	High	High.
51:								
Ft. Green	D	None	---	0.5-1.5	Apparent	>60	High	Moderate.
Bivans	D	None	---	0.5-1.5	Perched	>60	High	Moderate.
55:								
Pedro	C	None	---	>6.0	---	6-20	Moderate	Moderate.
Jonesville	B	None	---	>6.0	---	24-40	Low	Low.
Shadeville	B	None	---	4.0-6.0	Perched	40-72	Low	Moderate.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	High water table: Depth	High water table: Kind	Depth to bedrock	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
				Ft		In		
56:								
Moriah	C	None	---	1.5-3.5	Perched	40-72	High	High.
Bushnell	C	None	---	1.5-3.0	Perched	20-40	High	Moderate.
Mabel	C	None	---	1.5-3.0	Perched	40-72	High	Moderate.
57 Paola	A	None	---	>6.0	---	>60	Low	High.
58:								
Boca	B/D	None	---	0-1.0	Apparent	24-40	High	Moderate.
Holopaw	B/D	None	---	0-1.0	Apparent	45-80	High	Moderate.
59:								
Aripeka	C	None	---	1.5-2.5	Apparent	20-40	High	Low.
Matmon	D	None	---	1.0-2.0	Apparent	10-20	High	Low.
60:								
EauGallie	B/D	None	---	0-1.0	Apparent	50-80	High	Moderate.
Holopaw	B/D	None	---	0-1.0	Apparent	45-80	High	Moderate.
62:								
Millhopper	A	None	---	4.0-6.0	Perched	>60	Low	Moderate.
Bonneau	A	None	---	4.0-6.0	Perched	>60	Moderate	High.
65:								
Sparr	C	None	---	1.5-3.5	Apparent	>60	Moderate	High.
Lochloosa	C	None	---	2.5-5.0	Apparent	>60	High	High.
66:								
Levyville	B	None	---	>5.0	Apparent	>60	High	Moderate.
Shadeville	B	None	---	4.0-6.0	Perched	40-72	Low	Moderate.
67:								
Immokalee	B/D	None	---	0.5-1.5	Apparent	40-72	High	Moderate.
Janney	C/D	None	---	0.5-1.5	Apparent	20-40	Moderate	High.
68:								
Myakka	B/D	None	---	0.5-1.5	Apparent	40-80	High	High.
Immokalee	B/D	None	---	0.5-1.5	Apparent	>60	High	High.
69:								
Broward	C	None	---	1.5-2.5	Apparent	20-40	Low	Low.
Lutterloh	C	None	---	1.5-2.5	Apparent	>60	High	Moderate.
70:								
Hallandale	B/D	None	---	0-1.0	Apparent	4-20	High	Low.
Boca	B/D	None	---	0-1.0	Apparent	24-40	High	Moderate.
Holopaw	B/D	None	---	0-1.0	Apparent	>60	High	Moderate.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	High water table: Depth	High water table: Kind	Depth to bedrock	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
				Ft		In		
71----------------- Pender	C	None---------	---	1.5-2.5	Apparent	>60	Moderate	Moderate.
72:								
Levyville---------	B	None---------	---	>5.0	Apparent	>60	High-----	Moderate.
Hague-------------	A	None---------	---	>6.0	---	>60	Low------	High.
73----------------- Orlando	A	None---------	---	>6.0	---	>60	Low------	High.
74. Arents								
75----------------- Orlando	A	None---------	---	>6.0	---	>60	Low------	High.
76----------------- Astatula	A	None---------	---	>6.0	---	>60	Low------	High.
77----------------- Candler	A	None---------	---	>6.0	---	>60	Low------	High.
78----------------- Micanopy	C	None---------	---	1.5-2.5	Perched	>60	High-----	High.

TABLE 17.--PHYSICAL ANALYSES OF SELECTED SOILS

(The pedons for all of the soils listed are typical of the series in the survey area. For the location of the the series description in the section "Soil Series and Their Morphology." Some of these properties differ those given in table 15. Most of the differences are within the parameters of normal laboratory error. T significantly affect use and management of the soils. A dash indicates material was not detected or data determined)

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity	Bulk density (field moist)
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3
Adamsville fine sand:												
S86FL-75-19-1	0-6	Ap1	0.0	0.2	18.5	69.6	7.1	95.5	3.3	1.2	12.9	1.52
-2	6-14	Ap2	0.0	0.2	19.8	69.9	6.0	95.9	1.9	2.2	27.5	1.52
-3	14-32	C1	0.0	0.2	17.8	70.3	7.9	96.2	2.8	1.0	38.0	1.56
-4	32-43	C2	0.0	0.3	16.6	71.4	8.4	96.7	0.2	3.1	65.7	1.51
-5	43-70	C3	0.0	0.2	17.7	70.6	8.1	96.6	1.0	2.4	49.6	1.56
-6	70-80	C4	0.0	0.1	15.8	74.0	7.7	97.6	1.6	0.8	50.9	1.59
Astatula fine sand:												
S86FL-75-11-1	0-5	A	0.0	0.1	18.8	76.7	2.1	97.7	0.9	1.4	57.9	1.40
-2	5-25	C1	0.0	0.1	18.4	76.5	2.4	97.4	1.1	1.5	51.3	1.49
-3	25-59	C2	0.0	0.1	19.7	75.8	2.2	97.8	0.6	1.6	53.9	1.55
-4	59-80	C3	0.0	0.1	19.4	76.2	2.0	97.7	0.6	1.7	50.0	1.57
Candler fine sand:												
S86FL-75-10-1	0-8	Ap	0.0	0.1	10.2	80.9	6.1	97.3	0.9	1.8	21.7	1.58
-2	8-19	E1	0.0	0.1	9.6	81.4	6.3	97.4	1.2	1.4	39.4	1.52
-3	19-37	E2	0.0	0.3	9.9	81.4	6.2	97.8	0.8	1.4	35.5	1.52
-4	37-52	E3	0.0	0.2	10.0	81.3	6.1	97.6	1.5	0.9	30.2	1.61
-5	52-80	E&Bt	0.0	0.2	11.0	80.7	5.8	97.7	1.4	0.9	28.9	1.55
Cracker mucky clay:												
S86FL-75-13-1	0-4	A	0.0	0.3	2.8	7.9	6.1	17.1	20.6	62.3	---	---
-2	4-12	C	0.0	1.1	9.8	24.8	14.8	50.5	15.0	34.5	---	---
Demory sandy clay loam:												
S86FL-75-21-1	0-3	Oa										
-2	3-7	A	0.0	1.1	16.3	35.0	12.1	64.6	11.0	24.4	---	---
-3	7-9	C	0.0	1.9	17.3	35.2	12.1	66.4	7.4	26.2	---	---

TABLE 17.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity	Bulk density (field moist)
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3
Ft. Green fine sand:												
S86FL-75-23-1	0-7	A	0.0	1.9	21.5	55.5	14.0	93.0	5.4	1.6	9.3	1.50
-2	7-28	E	0.0	2.1	24.2	56.1	13.6	96.0	4.0	0.0	16.9	1.65
-3	28-33	E/B	0.0	2.3	20.7	49.4	11.6	84.0	6.6	9.4	0.5	1.82
-4	33-46	Btg1	0.1	2.8	20.5	43.2	10.6	77.2	6.3	16.5	0.1	1.79
-5	46-60	Btg2	0.1	2.9	21.2	36.7	8.4	69.3	5.6	25.1	0.1	1.82
-6	60-67	Btg3	0.0	1.3	7.6	34.6	14.3	57.8	8.2	34.0	0.0	1.54
-7	67-80	Btg4	0.0	0.7	6.1	33.4	15.8	56.0	9.9	34.1	0.0	1.53
Hicoria fine sand:												
S86FL-75-22-1	0-11	Ap	0.0	1.5	21.2	55.0	14.5	92.2	4.2	3.6	30.3	1.47
-2	11-17	A	0.0	1.6	21.4	54.6	14.7	92.4	3.4	4.1	5.7	1.59
-3	17-23	E	0.1	1.7	19.9	53.2	12.2	87.1	7.5	5.4	7.9	1.58
-4	23-30	Btg1	0.0	1.2	13.0	39.2	15.2	68.6	5.2	26.2	0.5	1.59
-5	30-41	Btg2	0.0	0.9	11.4	36.0	24.9	73.2	5.6	21.2	0.4	1.45
-6	41-60	Btg3	0.0	1.2	15.5	39.9	15.0	71.6	5.8	22.6	0.7	1.85
-7	60-80	2Btg	0.0	1.4	17.5	45.2	6.5	70.6	5.4	24.0	0.2	1.73
Jonesville fine sand:												
S86FL-75-6-1	0-5	Ap	0.1	2.7	17.2	63.7	13.5	97.2	1.8	1.0	27.0	1.33
-2	5-14	E1	0.2	3.1	17.6	63.6	12.8	97.3	2.1	0.6	16.9	1.54
-3	14-27	E2	0.1	2.8	16.4	64.5	13.5	97.3	2.1	0.6	21.7	1.60
-4	27-35	Bt	0.2	1.7	13.2	42.6	8.5	66.2	4.2	29.6	1.3	1.49
Levyville loamy fine sand:												
S87FL-75-29-1	0-8	Ap	0.0	1.4	15.0	55.4	14.3	86.1	5.6	8.3	13.8	1.50
-2	8-29	Bt1	0.1	1.2	10.4	37.6	10.6	59.9	7.1	33.0	1.3	1.49
-3	29-41	Bt2	0.1	1.0	10.8	37.0	10.3	59.2	7.0	33.8	0.4	1.49
-4	41-54	Bt2	0.0	1.2	11.2	39.4	11.2	63.0	7.7	29.3	0.4	1.50
-5	54-67	Bt3	0.2	1.1	10.7	37.5	11.6	61.1	9.4	29.5	2.0	1.41
-6	67-80	Bt3	0.1	1.0	10.0	38.5	12.0	61.6	9.5	28.9	1.1	1.56
Lutterloh fine sand:												
S86FL-75-26-1	0-7	Ap	0.0	1.3	12.8	66.1	13.7	94.0	3.9	2.1	14.5	1.53
-2	7-23	E1	0.0	1.0	11.8	68.2	13.7	94.7	4.0	1.3	25.9	1.56
-3	23-42	E2	0.0	1.6	11.5	69.4	13.0	95.5	3.3	1.2	23.0	1.58
-4	42-57	E3	0.0	1.4	10.7	69.0	15.0	96.1	2.9	1.0	15.1	1.66
-5	57-69	Btg1	0.0	0.5	9.1	52.7	11.1	73.4	4.6	22.0	0.2	1.74
-6	69-80	Btg2	0.0	0.6	6.4	33.8	7.2	48.0	6.3	45.7	0.2	1.62

TABLE 17.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity	Bulk density (field moist)
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3
Mable fine sand:												
S86FL-75-24-1	0-7	Ap	0.1	1.8	20.1	58.6	11.9	92.5	4.3	3.1	21.3	1.31
-2	7-14	E	0.1	1.5	16.0	59.1	13.8	90.5	5.5	4.0	20.3	1.54
-3	14-18	Bt1	0.1	1.0	9.8	35.0	9.5	55.4	7.5	37.1	0.7	1.52
-4	18-31	Bt2	0.0	0.6	8.5	27.7	7.4	44.2	6.8	49.0	1.0	1.42
-5	31-41	Btg1	0.1	0.6	7.1	23.1	6.4	37.3	7.9	54.8	3.0	1.34
-6	41-53	Btg2	0.0	0.2	3.0	9.6	2.0	14.8	9.6	75.5	4.4	1.09
Matmon fine sand:												
S87FL-75-28-1	0-3	A	0.0	0.2	6.0	55.6	28.5	90.3	5.2	4.5	16.7	1.13
-2	3-6	E	0.0	0.2	5.8	56.1	26.8	88.9	7.2	3.9	11.6	1.43
-3	6-15	Bt	0.0	0.2	4.2	31.8	18.0	54.2	12.4	33.4	0.2	1.28
Millhopper fine sand:												
S86FL-75-20-1	0-4	Ap1	0.0	0.2	12.6	75.8	7.6	96.2	3.7	0.1	21.7	1.31
-2	4-8	Ap2	0.0	0.3	10.6	75.2	8.2	94.3	0.1	5.6	49.4	1.33
-3	8-18	E1	0.0	0.2	10.6	76.4	8.9	96.1	1.1	2.8	40.8	1.42
-4	18-41	E2	0.0	0.3	11.4	76.7	8.2	96.6	0.8	2.6	43.4	1.51
-5	41-55	E3	0.0	0.2	10.7	77.5	8.6	97.0	0.1	2.9	35.7	1.55
-6	55-63	EB	0.0	0.3	9.6	72.7	7.9	90.5	0.6	8.9	16.4	1.53
-7	63-80	Bt	0.0	0.3	9.4	62.6	5.5	77.8	1.4	20.8	0.7	1.63
Moriah fine sand:												
S86FL-75-27-1	0-9	Ap	0.0	0.9	22.1	63.8	9.3	96.1	1.0	2.9	25.6	1.52
-2	9-16	E1	0.0	1.2	20.6	62.7	11.2	95.7	3.6	0.7	24.1	1.60
-3	16-28	E2	0.0	1.4	19.2	64.2	11.2	96.0	3.7	0.3	22.4	1.57
-4	28-32	Bt	0.0	1.4	13.7	50.8	10.5	76.4	5.2	18.4	0.8	1.70
-5	32-44	Btg1	0.0	0.9	13.9	49.4	9.0	73.2	5.3	21.5	0.2	1.76
-6	44-52	Btg2	0.0	1.0	15.2	52.4	9.3	77.9	5.7	16.4	0.3	1.84
-7	52-68	Btg3	0.0	0.2	4.3	10.0	2.0	33.0	10.4	56.6	0.2	1.42
Orsino fine sand:												
S85FL-75-1-1	0-4	A	0.0	0.1	9.8	82.7	5.6	98.2	1.3	0.5	23.7	1.48
-2	4-8	E1	0.0	0.1	10.3	82.9	5.5	98.8	0.8	0.4	31.6	1.56
-3	8-13	E2	0.0	0.1	10.4	83.6	5.1	99.2	0.5	0.3	26.6	1.55
-4	13-48	Bw1	0.0	0.1	9.9	83.0	5.3	98.3	1.0	0.7	31.6	1.59
-5	48-58	Bw2	0.0	0.1	9.0	84.2	5.2	98.5	0.7	0.8	39.4	1.58
-6	58-70	Bw3	0.0	0.2	9.2	84.5	5.4	99.3	0.0	0.7	51.3	1.55
-7	70-80	C	0.0	0.1	8.0	86.0	5.6	99.7	0.0	0.3	42.1	1.57

TABLE 17.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity	Bulk density (field moist)
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3
Otela fine sand:												
S85FL-75-5-1	0-8	Ap	0.1	2.6	17.0	52.3	21.8	93.8	4.1	2.1	7.4	1.72
-2	8-21	E1	0.0	2.4	16.3	53.7	22.5	94.9	3.5	1.6	13.1	1.65
-3	21-32	E2	0.1	2.1	15.6	52.9	24.5	95.2	3.3	1.5	20.4	1.57
-4	32-50	E3	0.1	2.4	16.8	54.3	22.4	96.0	3.0	1.0	16.4	1.60
-5	50-61	Bt1	0.0	2.0	15.4	41.0	19.8	78.2	3.9	17.9	0.4	1.71
-6	61-68	Bt2	0.0	2.0	18.2	40.6	15.2	76.0	3.3	20.7	0.7	1.69
-7	68-80	Btg	0.0	1.8	20.0	41.8	9.4	73.0	2.9	24.1	0.1	1.73
Pedro fine sand:												
S86FL-75-25-1	0-8	Ap	0.0	1.5	17.1	63.3	11.4	93.3	2.6	4.0	18.5	1.53
-2	8-12	E	0.0	1.1	15.2	63.1	12.2	91.6	4.6	3.8	10.6	1.66
-3	12-15	Bt	0.0	1.5	15.3	53.3	10.7	80.8	5.6	13.6	13.1	1.53
Shadeville fine sand:												
S85FL-75-3-1	0-8	Ap	1.1	3.4	15.7	48.9	23.8	92.9	5.2	1.9	9.9	1.61
-2	8-27	E1	1.0	3.1	15.8	52.0	22.9	94.8	3.5	1.7	14.1	1.68
-3	27-35	E2	1.5	3.4	14.9	51.1	24.7	95.6	3.4	1.0	22.7	1.58
-4	35-60	Bt	0.4	2.8	14.4	42.4	21.6	81.6	4.2	14.2	1.3	1.70
-5	60-64	2Btg	0.2	1.8	13.2	48.2	14.2	77.6	3.4	19.0	0.5	1.64
Smyrna fine sand:												
S85FL-75-2-1	0-5	A	0.0	0.5	12.0	65.1	18.3	95.9	3.2	0.9	18.7	1.36
-2	5-9	E1	0.0	0.5	11.6	65.8	19.4	97.3	1.9	0.8	8.9	1.51
-3	9-19	E2	0.0	0.5	11.3	67.4	18.8	98.0	1.4	0.6	10.0	1.52
-4	19-23	Bh	0.0	0.4	10.4	63.9	19.1	93.8	3.1	3.1	2.2	1.33
-5	23-28	Bc	0.0	0.5	11.2	64.2	18.2	94.1	2.1	3.8	6.8	1.47
-6	28-57	C1	0.0	0.5	10.6	65.6	20.0	96.7	1.4	1.9	1.2	1.58
-7	57-80	C2	0.0	0.2	6.1	79.2	14.0	99.5	0.1	0.4	18.7	1.68
Sparr fine sand:												
S86FL-75-12-1	0-6	Ap	0.0	0.7	12.9	64.4	15.2	95.6	1.8	2.6	22.4	1.45
-2	6-18	E1	0.0	0.5	12.1	66.5	16.6	95.7	2.5	1.8	17.7	1.54
-3	18-30	E2	0.0	0.5	11.0	65.7	18.9	96.1	2.2	1.7	20.4	1.53
-4	30-54	E3	0.0	0.5	10.4	67.6	18.8	97.3	1.6	1.1	15.8	1.56
-5	54-80	Btg	0.0	0.6	11.1	54.5	10.9	77.1	2.3	20.6	0.2	1.72
Tavares fine sand:												
S86FL-75-9-1	0-7	Ap	0.0	0.2	9.9	78.4	6.9	95.4	1.4	3.2	26.3	1.50
-2	7-24	C1	0.0	0.1	10.3	77.2	7.2	94.8	2.3	2.9	35.5	1.48
-3	24-41	C2	0.0	0.2	11.0	77.5	6.4	95.1	1.8	3.1	42.7	1.46
-4	41-58	C3	0.0	0.2	9.2	79.1	7.0	95.5	1.2	3.3	32.9	1.55
-5	58-80	C4	0.0	0.2	8.7	80.3	7.0	96.2	1.0	2.8	34.2	1.58

TABLE 17.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity	Bulk density (field moist)
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3
Waccasassa sandy clay loam:												
S86FL-75-8-1	0-2	A	0.0	1.1	16.5	41.1	10.6	69.3	8.7	22.0	16.9	1.07
-2	2-12	Bt	0.3	2.3	18.1	38.2	10.8	69.7	7.7	22.6	7.6	1.25
Wauchula fine sand:												
S86FL-75-18-1	0-4	Ap	0.0	0.2	7.0	48.4	40.0	95.7	3.7	0.6	36.8	1.26
-2	4-18	E	0.0	0.3	6.4	49.4	40.6	96.7	3.0	0.3	7.6	1.61
-3	18-21	Bh1	0.0	0.4	6.3	49.4	36.8	92.9	5.1	2.0	3.0	1.60
-4	21-27	Bh2	0.0	0.4	6.7	59.6	26.7	93.4	2.1	4.5	9.5	1.57
-5	27-32	Bw	0.0	0.4	6.0	52.5	34.2	93.1	2.5	4.4	9.4	1.62
-6	32-47	Btg1	0.0	0.3	5.5	36.1	30.2	72.1	3.8	24.1	1.1	1.40
-7	47-61	Btg2	0.0	0.3	5.8	38.5	30.4	75.0	2.1	22.9	1.0	1.50
-8	61-80	BCg	0.0	0.4	8.7	54.6	25.7	89.4	1.1	9.5	0.4	1.78
Wekiva fine sand:												
S86FL-75-17-1	0-4	A	0.0	0.5	12.3	65.3	12.2	90.3	4.9	4.8	5.5	1.43
-2	4-9	E	0.2	0.7	12.6	68.4	11.8	93.7	4.8	1.5	1.3	1.60
-3	9-18	2Bt	0.3	0.6	8.6	44.9	6.6	61.0	8.6	30.4	0.0	1.59

TABLE 18.--CHEMICAL ANALYSES OF SELECTED SOILS

(The pedons for all of the soils listed are typical of the series in the survey area. For the location of the sample the series description in the section "Soil Series and Their Morphology." Some of these properties differ sligh given in table 15. Most of the differences are within the parameters of normal laboratory error. They do not s affect use and management of the soils. A dash indicates material was not detected or data were not determined)

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O (1:1)	$CaCl_2$ 0.01M (1:2)	KCl 1N (1:1)	Pyropho extrac: C	F
	In		----Milliequivalents/100 grams of soil-----							Pct	Pct	Mmhos/cm				Pct	Pc
Adamsville fine sand:																	
S86FL-75-19-1	0-6	Ap1	0.21	0.07	0.01	0.01	0.30	6.77	7.07	4	1.35	0.03	4.7	4.8	3.9	---	-
-2	6-14	Ap2	0.19	0.04	0.02	0.01	0.26	5.20	5.46	5	0.76	0.02	4.9	5.1	4.5	---	-
-3	14-32	C1	0.04	0.02	0.01	0.00	0.07	2.52	2.59	3	0.39	0.02	4.8	5.2	4.8	---	-
-4	32-43	C2	0.03	0.02	0.02	0.00	0.07	2.66	2.73	3	0.24	0.03	4.6	5.0	4.7	---	-
-5	43-70	C3	0.03	0.02	0.02	0.00	0.07	1.98	2.05	3	0.15	0.02	4.8	5.1	4.8	---	-
-6	70-80	C4	0.03	0.04	0.01	0.00	0.08	1.07	1.15	7	0.11	0.01	5.2	5.2	4.9	---	-
Astatula fine sand:																	
S86FL-75-11-1	0-5	A	0.55	0.07	0.01	0.01	0.64	2.09	2.73	23	0.55	0.02	5.5	4.8	4.6	---	-
-2	5-25	C1	0.04	0.02	0.01	0.00	0.07	1.48	1.55	5	0.17	0.02	5.2	4.7	4.7	---	-
-3	25-59	C2	0.02	0.01	0.01	0.00	0.04	0.71	0.75	5	0.09	0.01	5.0	4.7	4.7	---	-
-4	59-80	C3	0.02	0.02	0.01	0.00	0.05	0.82	0.87	6	0.04	0.02	5.0	4.7	4.7	---	-
Candler fine sand:																	
S86FL-75-10-1	0-8	Ap	1.20	0.19	0.01	0.06	1.46	2.92	4.38	33	0.67	0.03	5.6	5.0	5.1	---	-
-2	8-19	E1	0.57	0.03	0.01	0.01	0.62	1.05	1.67	37	0.19	0.02	5.7	5.4	5.6	---	-
-3	19-37	E2	0.37	0.03	0.01	0.01	0.42	0.62	1.04	40	0.07	0.02	5.8	5.5	5.6	---	-
-4	37-52	E3	0.25	0.04	0.02	0.01	0.32	0.43	0.75	43	0.05	0.01	5.9	5.5	5.4	---	-
-5	52-80	E&Bt	0.24	0.04	0.01	0.01	0.30	0.46	0.76	39	0.04	0.01	6.0	5.7	5.6	---	-
Cracker mucky clay:																	
S86FL-75-13-1	0-4	A	15.00	18.93	28.49	2.76	65.18	10.45	75.63	86	12.66	0.05	6.8	6.8	7.2	---	-
-2	4-12	C	9.00	8.23	13.05	2.20	32.48	6.35	38.83	84	3.30	0.01	7.1	6.6	7.1	---	-
Demory sandy clay loam:																	
S86FL-75-21-1	0-3	Oa	34.00	18.10	5.20	0.41	57.71	15.78	73.49	79	16.12	0.00	6.6	5.7	5.8	---	-
-2	3-7	A	19.00	8.23	3.15	0.24	30.62	8.01	38.63	79	6.54	0.00	6.7	5.9	6.3	---	-
-3	7-9	C	5.76	5.76	1.72	0.11	13.35	4.20	17.55	76	2.20	0.00	7.1	6.1	6.8	---	-

TABLE 18.--CHEMICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O (1:1)	$CaCl_2$ 0.01M (1:2)	KCl 1N (1:1)	Pyrophosphate extractable: C	F
	In		----Milliequivalents/100 grams of soil-----							Pct	Pct	Mmhos/cm				Pct	Pc
Ft. Green fine sand:																	
S86FL-75-23-1	0-7	A	1.17	0.18	0.03	0.02	1.40	4.07	5.47	26	0.86	0.07	3.9	3.9	3.8	---	-
-2	7-28	E	0.12	0.03	0.02	0.00	0.17	0.65	0.82	21	0.03	0.02	4.6	4.0	4.2	---	-
-3	28-33	E/B	1.95	0.19	0.10	0.01	2.25	6.67	8.92	25	0.13	0.03	4.5	4.5	3.8	---	-
-4	33-46	Btg1	5.35	0.82	0.29	0.05	6.51	15.46	21.97	30	0.36	0.03	4.8	4.4	3.7	---	-
-5	46-60	Btg2	9.70	1.48	0.44	0.15	11.77	8.19	19.96	59	0.26	0.06	5.0	4.4	4.2	---	-
-6	60-67	Btg3	22.50	2.55	0.74	0.34	26.13	12.19	38.32	68	0.43	0.08	5.4	4.7	4.6	---	-
-7	67-80	Btg4	20.25	2.96	0.80	0.37	24.38	12.33	36.71	66	0.41	0.09	5.9	5.2	4.7	---	-
Hicoria fine sand:																	
S86FL-75-22-1	0-11	Ap	1.00	0.41	0.03	0.38	1.82	3.04	4.86	37	1.65	0.10	5.1	4.9	4.8	---	-
-2	11-17	A	0.14	0.04	0.03	0.12	0.33	0.90	1.23	27	0.64	0.04	5.1	4.6	4.6	---	-
-3	17-23	E	0.18	0.06	0.04	0.05	0.33	1.82	2.15	15	0.33	0.03	4.7	4.6	4.7	---	-
-4	23-30	Btg1	0.70	0.17	0.04	0.11	1.02	9.42	10.44	10	0.39	0.07	4.5	3.9	3.9	---	-
-5	30-41	Btg2	0.98	0.12	0.06	0.05	1.21	6.79	8.00	15	0.16	0.02	3.7	3.9	3.8	---	-
-6	41-60	Btg3	2.02	0.24	0.06	0.04	2.36	7.44	9.80	24	0.06	0.02	4.6	3.9	3.7	---	-
-7	60-80	Btg4	5.12	0.82	0.07	0.07	6.08	11.43	17.51	35	0.13	0.05	4.2	3.9	3.5	---	-
Jonesville fine sand:																	
S86FL-75-6-1	0-5	Ap	2.92	0.13	0.02	0.01	3.08	1.46	4.54	68	0.47	0.03	6.2	6.1	6.3	---	-
-2	5-14	E1	0.94	0.04	0.01	0.00	0.99	0.59	1.58	63	0.15	0.02	6.4	6.0	6.2	---	-
-3	14-27	E2	0.35	0.02	0.01	0.00	0.38	0.53	0.91	42	0.11	0.02	6.3	6.0	6.0	---	-
-4	27-35	Bt	13.50	0.19	0.07	0.05	13.81	3.21	17.02	81	0.42	0.06	7.5	6.3	6.7	---	-
Levyville loamy fine sand:																	
S87FL-75-29-1	0-8	Ap	3.42	1.19	0.04	0.46	5.13	7.03	12.16	42	0.86	0.05	5.8	4.9	4.9	---	-
-2	8-29	Bt1	7.35	3.09	0.08	0.14	10.66	18.11	28.77	37	0.25	0.11	5.4	4.5	4.4	---	-
-3	29-41	Bt2	6.02	3.17	0.08	0.11	9.38	20.99	30.37	31	0.16	0.05	5.0	4.2	4.3	---	-
-4	41-54	Bt2	5.35	2.47	0.07	0.09	7.98	16.80	24.78	32	0.09	0.05	5.0	4.2	4.2	---	-
-5	54-67	Bt3	6.85	2.34	0.09	0.10	9.38	16.23	25.61	37	0.08	0.04	4.6	4.2	4.2	---	-
-6	67-80	Bt3	7.65	2.10	0.10	0.11	9.96	15.86	25.82	39	0.07	0.04	4.7	4.2	4.2	---	-
Lutterloh fine sand:																	
S86FL-75-26-1	0-7	Ap	1.42	0.32	0.03	0.03	1.80	3.60	5.40	33	0.99	0.10	4.7	4.5	4.4	---	-
-2	7-23	E1	0.20	0.11	0.02	0.00	0.33	1.71	2.04	16	0.26	0.03	5.0	4.8	4.6	---	-
-3	23-42	E2	0.10	0.06	0.02	0.00	0.18	0.44	0.62	29	0.07	0.02	5.1	4.7	4.7	---	-
-4	42-57	E3	0.09	0.04	0.02	0.00	0.15	0.26	0.41	37	0.06	0.01	5.6	4.9	4.9	---	-
-5	57-69	Btg1	3.70	0.78	0.08	0.04	4.60	3.83	8.43	55	0.08	0.03	4.9	4.4	4.3	---	-
-6	69-80	Btg2	8.55	0.99	0.19	0.08	9.81	10.97	20.78	47	0.46	0.05	4.5	4.1	3.5	---	-

TABLE 18.--CHEMICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases Ca	Extractable bases Mg	Extractable bases Na	Extractable bases K	Extractable bases Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH H_2O (1:1)	pH $CaCl_2$ 0.01M (1:2)	pH KCl 1N (1:1)	Pyropho[sphate] extrac[table] C	E
	In		----Milliequivalents/100 grams of soil-----							Pct	Pct	Mmhos/cm				Pct	Pc
Mabel fine sand:																	
S87FL-75-24-1	0-7	Ap	1.35	0.26	0.03	0.01	1.65	5.20	6.85	24	1.14	0.04	5.0	5.4	4.2	---	-
-2	7-14	E	8.15	0.23	0.02	0.00	8.40	3.29	11.69	72	0.35	0.02	5.0	4.7	4.2	---	-
-3	14-18	Bt1	7.40	1.23	0.09	0.04	8.76	15.40	24.16	36	0.41	0.04	4.6	4.6	3.8	---	-
-4	18-31	Bt2	10.00	1.32	0.10	0.07	11.49	14.84	26.33	44	0.24	0.04	4.5	4.3	3.6	---	-
-5	31-41	Btg1	15.25	0.99	0.13	0.10	16.47	15.88	32.35	51	0.43	0.04	4.8	4.6	4.0	---	-
-6	41-53	Btg2	31.25	0.82	0.21	0.21	32.49	16.29	48.78	67	0.53	0.04	4.9	5.0	3.7	---	-
Matmon fine sand:																	
S87FL-75-28-1	0-3	A	5.70	1.44	0.06	0.07	7.27	7.45	14.72	49	2.65	0.13	5.5	5.0	5.1	---	-
-2	3-6	E	2.35	0.74	0.03	0.01	3.13	2.71	5.84	54	0.53	0.04	5.8	4.9	5.0	---	-
-3	6-15	Bt	22.75	12.76	0.14	0.14	35.79	12.84	48.63	74	1.02	0.15	7.5	6.3	6.1	---	-
Millhopper fine sand:																	
S86FL-75-20-1	0-4	Ap1	0.31	0.11	0.02	0.00	0.44	6.42	6.86	6	1.17	0.05	4.4	4.3	3.8	---	-
-2	4-8	Ap2	0.32	0.13	0.02	0.00	0.47	6.91	7.38	6	0.92	0.03	5.0	4.9	4.2	---	-
-3	8-18	E1	0.14	0.11	0.01	0.00	0.25	3.56	3.82	7	0.53	0.04	5.1	5.0	4.5	---	-
-4	18-41	E2	0.09	0.11	0.01	0.00	0.21	2.02	2.23	9	0.24	0.02	5.2	5.1	4.6	---	-
-5	41-55	E3	0.07	0.10	0.01	0.00	0.18	1.12	1.30	14	0.22	0.01	5.5	5.3	4.7	---	-
-6	55-63	EB	0.14	0.41	0.02	0.00	0.57	2.37	2.94	19	0.26	0.03	5.1	5.5	4.6	---	-
-7	63-80	Bt	0.09	0.62	0.03	0.00	0.74	4.93	5.67	13	0.22	0.03	5.0	4.1	4.3	---	-
Moriah fine sand:																	
S86FL-75-27-1	0-9	Ap	0.63	0.18	0.03	0.02	0.86	1.27	2.13	40	0.71	0.03	5.1	4.5	4.5	---	-
-2	9-16	E1	0.27	0.04	0.02	0.01	0.34	0.62	0.96	35	0.19	0.02	5.2	4.8	4.9	---	-
-3	16-28	E2	0.19	0.01	0.01	0.00	0.21	0.69	0.90	23	0.08	0.01	4.8	4.9	4.6	---	-
-4	28-32	Bt	3.32	0.74	0.05	0.03	4.14	4.21	8.35	50	0.20	0.03	5.0	4.3	4.1	---	-
-5	32-44	Btg1	4.57	0.49	0.06	0.05	5.17	5.02	10.19	51	0.13	0.02	4.8	4.3	4.1	---	-
-6	44-52	Btg2	4.42	0.27	0.05	0.03	4.77	2.94	7.71	62	0.06	0.02	4.9	4.4	4.1	---	-
-7	52-68	Btg3	25.24	1.56	0.16	0.35	27.31	9.22	36.53	75	0.22	0.04	6.6	5.4	5.2	---	-
Orsino fine sand:																	
S85FL-75-1-1	0-4	A	0.10	0.06	0.07	0.01	0.24	1.75	1.99	12	0.36	0.00	5.1	4.3	3.9	---	-
-2	4-8	E1	0.02	0.02	0.06	0.00	0.10	1.18	1.28	8	0.15	0.00	5.3	4.5	4.4	---	-
-3	8-13	E2	0.01	0.01	0.06	0.00	0.08	0.84	0.92	9	0.08	0.00	5.5	4.6	4.5	---	-
-4	13-48	Bw1	0.03	0.02	0.07	0.00	0.12	1.16	1.31	9	0.10	0.00	5.4	4.8	4.7	---	-
-5	48-58	Bw2	0.01	0.04	0.06	0.00	0.11	0.55	0.66	17	0.05	0.00	5.1	4.8	4.7	---	-
-6	58-70	Bw3	0.02	0.06	0.06	0.00	0.14	0.72	0.86	16	0.06	0.02	5.4	4.9	4.9	---	-
-7	70-80	C	0.04	0.07	0.06	0.00	0.17	0.16	0.33	52	0.02	0.01	5.7	5.2	5.1	---	-

TABLE 18.--CHEMICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases					Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH			Pyropho[sphate] extra[ctable]	
			Ca	Mg	Na	K	Sum						H_2O (1:1)	$CaCl_2$ 0.01M (1:2)	KCl 1N (1:1)	C	
	In		----Milliequivalents/100 grams of soil-----							Pct	Pct	Mmhos/cm				Pct	P
Otela fine sand:																	
S85FL-75-5-1	0-8	Ap	0.90	0.04	0.05	0.00	0.99	3.68	4.67	21	0.50	0.02	5.1	4.8	4.6	---	-
-2	8-21	E1	0.32	0.02	0.04	0.00	0.38	1.69	2.07	18	0.11	0.01	5.2	5.0	4.7	---	-
-3	21-32	E2	0.18	0.03	0.04	0.00	0.25	1.30	1.55	16	0.07	0.01	5.3	4.9	4.8	---	-
-4	32-50	E3	0.11	0.04	0.04	0.00	0.19	0.62	0.81	23	0.04	0.01	5.0	4.9	4.6	---	-
-5	50-61	Bt1	2.82	0.58	0.05	0.01	3.46	3.23	6.69	52	0.05	0.06	4.4	4.5	4.0	---	-
-6	61-68	Bt2	3.05	0.66	0.06	0.01	3.78	3.85	7.63	50	0.06	0.02	4.5	4.3	3.8	---	-
-7	68-80	Btg	3.85	0.66	0.06	0.02	4.59	3.46	8.05	57	0.04	0.02	4.3	4.2	3.7	---	-
Pedro fine sand:																	
S86FL-75-25-1	0-8	Ap	2.62	0.22	0.03	0.03	2.90	1.12	4.02	72	0.49	0.03	5.8	5.7	5.8	---	-
-2	8-11	E	1.62	0.09	0.03	0.01	1.75	1.01	2.76	63	0.22	0.03	5.9	5.8	5.8	---	-
-3	11-15	Bt	4.37	0.20	0.05	0.03	4.65	2.63	7.01	66	0.37	0.05	6.0	6.0	5.9	---	-
Shadeville fine sand:																	
S85FL-75-3-1	0-8	Ap	3.90	0.12	0.05	0.08	4.15	2.86	7.01	59	0.62	0.04	5.5	5.2	5.4	---	-
-2	8-27	E1	0.53	0.05	0.04	0.01	0.63	1.81	2.44	26	0.17	0.02	5.4	5.0	5.1	---	-
-3	27-35	E2	0.22	0.06	0.04	0.01	0.33	0.52	0.85	39	0.08	0.02	5.5	5.1	5.1	---	-
-4	35-60	Bt	6.15	1.03	0.06	0.06	7.30	3.75	11.05	66	0.09	0.10	5.4	4.7	4.4	---	-
-5	60-64	2Btg	9.32	0.29	0.07	0.10	9.78	3.94	13.72	71	0.08	0.04	5.7	5.4	5.1	---	-
Smyrna fine sand:																	
S85FL-75-2-1	0-5	A	0.62	0.18	0.13	0.02	0.95	2.60	3.55	27	1.08	0.04	4.5	3.6	3.4	---	-
-2	5-9	E1	0.27	0.12	0.09	0.00	0.48	2.16	2.64	18	0.54	0.00	4.2	3.5	3.4	---	-
-3	9-19	E2	0.07	0.09	0.07	0.00	0.23	0.98	1.21	19	0.11	0.00	5.1	3.8	3.7	---	-
-4	19-23	Bh	0.14	0.10	0.18	0.01	0.43	9.54	9.97	4	1.44	0.00	4.2	3.4	3.4	0.85	0
-5	23-28	BC	0.03	0.08	0.12	0.00	0.23	10.77	11.00	2	1.11	0.00	4.5	3.9	3.8	0.56	0
-6	28-57	C1	0.03	0.07	0.08	0.00	0.18	3.25	3.43	5	0.29	0.00	4.8	4.2	4.3	---	-
-7	57-80	C2	0.01	0.01	0.06	0.00	0.08	0.43	0.51	16	0.01	0.03	5.4	4.8	4.8	---	-
Sparr fine sand:																	
S86FL-75-12-1	0-6	Ap	2.22	0.86	0.03	0.05	3.16	5.55	8.71	36	1.52	0.04	5.2	4.9	4.8	---	-
-2	6-18	E1	0.99	0.13	0.02	0.01	1.15	2.19	3.34	34	0.45	0.03	5.7	5.4	5.1	---	-
-3	18-30	E2	0.54	0.07	0.02	0.01	0.64	1.68	2.32	28	0.25	0.02	5.8	5.4	5.1	---	-
-4	30-54	E3	0.11	0.01	0.01	0.00	0.13	1.03	1.16	11	0.07	0.02	5.7	5.3	5.0	---	-
-5	54-80	Btg	0.82	1.03	0.13	0.32	2.30	4.82	7.12	32	0.13	0.02	5.7	4.6	4.4	---	-
Tavares fine sand:																	
S86FL-75-9-1	0-7	Ap	0.60	0.10	0.01	0.11	0.82	5.07	5.89	14	0.86	0.03	6.0	5.0	4.5	---	-
-2	7-24	C1	0.13	0.03	0.00	0.02	0.18	1.77	1.95	9	0.34	0.02	5.9	5.1	4.7	---	-
-3	24-41	C2	0.05	0.01	0.00	0.01	0.07	2.67	2.74	3	0.17	0.02	5.5	4.8	4.7	---	-
-4	41-58	C3	0.06	0.01	0.00	0.00	0.07	1.40	1.47	5	0.09	0.01	5.3	4.8	4.7	---	-
-5	58-80	C4	0.13	0.03	0.01	0.01	0.18	1.29	1.47	12	0.06	0.02	5.3	4.8	4.7	---	-

TABLE 18.--CHEMICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O (1:1)	$CaCl_2$ 0.01M (1:2)	KCl 1N (1:1)	Pyropho[...] extrac[...]: C	F[...]
	In		----Milliequivalents/100 grams of soil-----							Pct	Pct	Mmhos/cm				Pct	Pc[...]
Waccasassa sandy clay loam:																	
S86FL-75-8-1	0-2	A	22.50	0.99	0.13	0.27	23.89	13.21	37.10	64	5.62	0.24	6.0	5.6	5.5	---	-
-2	2-12	Bt	9.85	0.53	0.07	0.06	10.51	6.98	17.49	60	1.46	0.07	6.4	6.0	5.9	---	-
Wauchula fine sand:																	
S86FL-75-18-1	0-4	Ap	0.27	0.14	0.04	0.02	0.47	6.35	6.82	7	1.22	0.08	3.8	3.2	3.4	---	-
-2	4-18	E	0.02	0.02	0.01	0.00	0.05	1.02	1.07	5	0.11	0.01	4.8	3.9	4.2	---	-
-3	18-21	Bh1	0.09	0.03	0.01	0.00	0.13	4.29	4.42	3	0.43	0.01	4.5	3.9	3.8	0.26	0.
-4	21-27	Bh2	0.10	0.04	0.02	0.00	0.16	10.61	10.77	1	0.76	0.03	4.5	4.1	4.0	0.58	0.
-5	27-32	Bw	0.06	0.04	0.01	0.00	0.11	6.39	6.50	2	0.39	0.07	5.5	4.3	4.4	---	-
-6	32-47	Btg1	0.49	0.86	0.06	0.04	1.45	17.22	18.67	8	0.40	0.03	4.7	4.0	4.0	---	-
-7	47-61	Btg2	0.63	1.03	0.06	0.03	1.75	17.22	18.95	9	0.22	0.04	4.4	4.2	3.9	---	-
-8	61-80	BCg	0.68	0.82	0.03	0.02	1.55	8.02	9.57	16	0.15	0.02	4.9	4.4	4.0	---	-
Wekiva fine sand:																	
S86FL-75-17-1	0-4	A	15.50	2.34	0.09	0.08	18.01	5.31	23.32	77	3.90	0.08	6.2	5.9	5.8	---	-
-2	4-9	E	1.70	0.25	0.04	0.01	2.00	0.77	2.77	72	0.24	0.02	6.1	5.8	6.0	---	-
-3	9-18	2Bt	16.25	3.29	0.10	0.10	19.74	4.65	24.39	81	0.45	0.01	6.6	6.4	6.5	---	-

TABLE 19.--CLAY MINERALOGY OF SELECTED SOILS

(The pedons for all of the soils listed are typical of the series in the survey area. For the location of the sample site, see the series description in the section "Soil Series and Their Morphology")

Soil name and sample number	Depth	Horizon	Clay minerals: Montmo-rillonite	14-angstrom intergrade	Kaolinite	Gibbsite	Quartz
	In		Pct	Pct	Pct	Pct	Pct
Adamsville fine sand:							
S86FL-75-19-1	0-6	Ap1		40	20		40
-4	32-43	C2	18	39	17		26
-6	70-80	C4	19	28	13		40
Astatula fine sand:							
S86FL-75-11-1	0-5	A		41	30	8	21
-4	59-80	C3		50	30	10	10
Candler fine sand:							
S86FL-75-10-1	0-8	Ap		23	52	5	20
-3	19-37	E2		30	50	10	10
-5	52-80	E&Bt		28	56	8	8
Cracker mucky clay:							
S86FL-75-13-1	0-4	A	31		32	18	19
-2	4-12	C	24	33	18		25
Demory sandy clay loam:							
S86FL-75-21-1	3-0	O		45	27		28
-3	4-6	C	32	30	20		18
Ft. Green fine sand:							
S86FL-75-23-1	0-7	Ap	46	27	10		17
-4	33-46	Btg1	52	11	15		22
-6	60-67	Btg3	79	9	4		8
Hicoria fine sand:							
S86FL-75-22-1	0-11	Ap		31	24		45
-4	23-30	Btg1		33	48		19
-6	41-60	Btg3	47	18	17		18
-7	60-80	Btg4	59	22	10		9
Jonesville fine sand:							
S86FL-75-6-1	0-5	Ap		23	58		19
-4	27-35	Bt		10	83		7
Levyville loamy fine sand:							
S87FL-75-29-1	0-8	Ap		30	54		16
-4	41-54	Bt2	40	16	20		24
-6	67-80	Bt3	49	22	19		10
Lutterloh fine sand:							
S86FL-75-26-1	0-7	Ap		42	34		24
-5	57-69	Btg1		26	57		17
Mabel fine sand:							
S86FL-75-24-1	0-7	Ap	18	30	33		19
-4	18-31	Bt2	14	18	49		19
-6	41-53	Btg2	44	17	29		10
Matmon fine sand:							
S87FL-75-28-1	0-3	A	81	8			11
-3	6-15	Bt	93	4			3

TABLE 19.--CLAY MINERALOGY OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Clay minerals: Montmorillonite	Clay minerals: 14-angstrom intergrade	Clay minerals: Kaolinite	Clay minerals: Gibbsite	Clay minerals: Quartz
	In		Pct	Pct	Pct	Pct	Pct
Millhopper fine sand:							
S86FL-75-20-1	0-4	Ap1		40	50		10
-4	18-41	E2		35	55		10
-7	63-80	Bt		28	68		4
Moriah fine sand:							
S86FL-75-27-1	0-9	Ap		41	36		23
-5	32-44	Btg1		14	57		29
-7	52-68	Btg3			70		30
Orsino fine sand:							
S85FL-75-1-1	0-4	A		56	14		30
-4	13-48	Bw1		67	14		19
-7	70-80	C		45	11		44
Otela fine sand:							
S85FL-75-5-1	0-8	Ap		27	46		27
-5	50-61	Bt1		24	65		11
-7	68-80	Btg		10	83		7
Pedro fine sand:							
S86FL-75-25-1	0-8	Ap		48	42		10
-3	12-15	Bt		41	48		10
Shadeville fine sand:							
S85FL-75-3-1	0-8	Ap	38	20	19		23
-4	35-60	Bt	35	42	16		7
-5	60-64	2Btg	76		17		7
Smyrna fine sand:							
S85FL-75-2-1	0-5	A		16	14		70
-4	19-23	Bh		23	23		54
-7	57-80	C2		40	44		16
Sparr fine sand:							
S86FL-75-12-1	0-6	Ap		26	52		22
-5	54-80	Btg		14	77		9
Tavares fine sand:							
S86FL-75-9-1	0-7	Ap		24	62		14
-3	24-41	C2		17	65		18
-5	58-80	C4		16	77	2	5
Waccasassa sandy clay loam:							
S86FL-75-8-1	0-2	A		38	34		28
-2	2-12	Bt		33	33		34
Wauchula fine sand:							
S86FL-75-18-1	0-4	Ap					100
-4	21-27	Bh2	18	34	10		38
-6	32-47	Btg1	57	27	7		9
-8	61-80	BCg	72	19	4		5
Wekiva fine sand:							
S86FL-75-17-1	0-4	A	17	40	19		24
-3	9-18	2Bt	22	32	25		21

TABLE 20.--ENGINEERING INDEX TEST DATA

(Tests were performed by the Florida Department of Transportation (FDOT) in cooperation with the U.S. Bureau of Public Roads, in accordance with standard procedures of the American Association of State Highway and Transportation Officials (AASHTO). See the section "Soil Series and Their Morphology" for location of pedons sampled. NP means nonplastic. Absence of an entry indicates that data were not estimated)

Soil name, report number, horizon, and depth in inches	Classification		Mechanical analysis: Percentage passing sieve--				Mechanical analysis: Percentage smaller than--				Liquid limit	Plasticity index	Moisture density: Maximum dry density	Moisture density: Optimum moisture
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm	Pct		Lb/cu ft	Pct
Adamsville fine sand: (S86FL-75-19)														
C1 ------- 14-32	A-3(0)	SP-SM	100	100	99	5	4	4	3	2		NP	108.0	12.5
Astatula fine sand: (S86FL-75-11)														
C2 ------- 25-59	A-3(0)	SP	100	100	100	3	3	3	2	2		NP	105.5	13.9
Candler fine sand: (S86FL-75-10)														
E2 ------- 19-37	A-3(0)	SP	100	100	100	4	4	3	2	2		NP	105.2	13.7
Ft. Green fine sand: (S86FL-75-23)														
Btg1 ----- 33-46	A-2-4(0)	SC-SM	100	100	80	24	21	19	16	16	20	5	115.5	13.0
Hicoria fine sand: (S86FL-75-22)														
Btg2 ----- 30-41	A-6(2)	SC	100	100	98	42	36	28	25	24	30	13	111.8	14.4
Jonesville fine sand: (S86FL-75-6)														
E2 ------- 14-27	A-3(0)	SP-SM	100	100	95	6	5	3	2	2		NP	105.9	13.3
Lutterloh fine sand: (S86FL-75-26)														
E1 ------- 7-23	A-2-4(0)	SP-SM	100	100	98	12	10	5	2	2		NP	110.0	11.5
Btg1 ----- 57-69	A-6(5)	SC	100	100	98	41	38	35	34	30	39	23	108.3	17.7
Mabel fine sand: (S86FL-75-24)														
Bt2 ------ 18-31	A-7-6(16)	CH	100	100	98	58	56	52	49	48	55	32	98.3	21.5
Matmon fine sand: (S87FL-75-28)														
Bt ------- 6-15	A-7-6(9)	CL	100	100	100	52	49	45	41	37	41	25	98.4	21.7
Millhopper fine sand: (S86FL-75-19)														
E2 ------- 18-41	A-3(0)	SP-SM	100	100	99	5	4	4	3	2		NP	106.7	12.6
Bt ------- 63-80	A-2-4(0)	SC	100	100	99	25	24	23	23	22	23	8	116.7	12.9
Moriah fine sand: (S86FL-75-27)														
E2 ------- 16-28	A-3(0)	SP-SM	100	100	97	9	6	4	2	1		NP	108.8	12.2
Btg1 ----- 32-44	A-2-6(0)	SC	100	100	97	29	28	26	23	22	28	13	117.9	13.1
Orsino fine sand: (S85FL-75-1)														
Bw1 ------ 13-48	A-3(0)	SP	100	100	99	2	2	0	0	0		NP	104.5	12.2

TABLE 20.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Mechanical analysis								Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--				Percentage smaller than--						Maximum dry density	Optimum moisture
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm				
											Pct		Lb/cu ft	Pct
Otela fine sand: (S85FL-75-5)														
E3 ------- 32-50	A-3(0)	SP-SM	100	100	96	9	6	4	0	0		NP	107.6	12.6
Pedro fine sand: (S86FL-75-25)														
Bt ------- 11-15	A-2-6(0)	SC	100	100	98	28	26	24	20	19	23	14	114.4	13.3
Shadeville fine sand: (S85FL-75-3)														
Bt ------- 35-60	A-2-4(0)	SM	100	100	94	24	23	21	14	14		NP	117.4	12.7
Smyrna fine sand: (S85FL-75-2)														
C1 ------- 28-57	A-3(0)	SP-SM	100	100	99	6	4	3	0	0		NP	108.3	12.7
Sparr fine sand: (S86FL-75-12)														
E3 ------- 30-54	A-3(0)	SP-SM	100	100	99	7	5	3	2	2		NP	107.1	13.7
Tavares fine sand: (S86FL-75-9)														
C2 ------- 24-41	A-3(0)	SP-SM	100	100	100	8	8	7	5	5		NP	108.6	13.4
Waccasassa sandy clay loam: (S86FL-75-8)														
Bt ------- 2-12	A-2-4(0)	SC	100	100	95	34	32	30	25	22	26	10	109.3	16.9
Wauchula fine sand: (S86FL-75-18)														
Btg1 ----- 32-47	A-6(0)	SC	100	100	99	37	32	28	26	26	32	12	106.1	18.2
Wekiva fine sand: (S86FL-75-17)														
Bt ------- 9-18	A-6(4)	SC	100	100	99	36	36	34	30	30	37	21	106.6	17.3

TABLE 21.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Adamsville	Hyperthermic, uncoated Aquic Quartzipsamments
Albany	Loamy, siliceous, thermic Grossarenic Paleudults
Apopka	Loamy, siliceous, hyperthermic Grossarenic Paleudults
Arents	Arents
Aripeka	Fine-loamy, siliceous, hyperthermic Aquic Hapludalfs
Astatula	Hyperthermic, uncoated Typic Quartzipsamments
Bivans	Fine, montmorillonitic, hyperthermic Typic Albaqualfs
Boca	Loamy, siliceous, hyperthermic Arenic Ochraqualfs
Bonneau	Loamy, siliceous, thermic Arenic Paleudults
Bradenton	Coarse-loamy, siliceous, hyperthermic Typic Ochraqualfs
Broward	Hyperthermic, uncoated Aquic Quartzipsamments
Bushnell	Fine, mixed, thermic Albaquic Hapludalfs
Candler	Hyperthermic, uncoated Typic Quartzipsamments
Cassia	Sandy, siliceous, hyperthermic Typic Haplohumods
Chobee	Fine-loamy, siliceous, hyperthermic Typic Argiaquolls
Cracker	Loamy, siliceous, thermic Lithic Haplaquolls
Demory	Loamy, siliceous, hyperthermic Lithic Haplaquolls
EauGallie	Sandy, siliceous, hyperthermic Alfic Haplaquods
Ft. Green	Loamy, siliceous, hyperthermic Arenic Ochraqualfs
Gator	Loamy, siliceous, euic, hyperthermic Terric Medisaprists
Hague	Loamy, siliceous, hyperthermic Arenic Hapludalfs
Hallandale	Siliceous, hyperthermic Lithic Psammaquents
Hicoria	Loamy, siliceous, hyperthermic Typic Umbraqualfs
Holopaw	Loamy, siliceous, hyperthermic Grossarenic Ochraqualfs
Immokalee	Sandy, siliceous, hyperthermic Arenic Haplaquods
Janney	Sandy, siliceous, hyperthermic Entic Haplaquods
Jonesville	Loamy, siliceous, hyperthermic Arenic Hapludalfs
Levyville	Fine-loamy, siliceous, hyperthermic Ultic Hapludalfs
Lochloosa	Loamy, siliceous, hyperthermic Aquic Arenic Paleudults
Lutterloh	Loamy, siliceous, thermic Grossarenic Paleudalfs
Mabel	Fine, mixed, hyperthermic Albaquic Hapludalfs
Matmon	Loamy, siliceous, thermic, shallow Aquic Hapludalfs
Micanopy	Fine, mixed, hyperthermic Aquic Paleudalfs
Millhopper	Loamy, siliceous, hyperthermic Grossarenic Paleudults
Moriah	Loamy, siliceous, thermic Aquic Arenic Hapludalfs
Myakka	Sandy, siliceous, hyperthermic Aeric Haplaquods
Orlando	Sandy, siliceous, hyperthermic Quartzipsammentic Haplumbrepts
Orsino	Hyperthermic, uncoated Spodic Quartzipsamments
Otela	Loamy, siliceous, thermic Arenic Hapludalfs
Ousley	Thermic, uncoated Aquic Quartzipsamments
Paola	Hyperthermic, uncoated Spodic Quartzipsamments
Pedro	Loamy, siliceous, hyperthermic, shallow Typic Hapludalfs
Pender	Fine-loamy, siliceous, thermic Albaquic Hapludalfs
Pineda	Loamy, siliceous, hyperthermic Arenic Glossaqualfs
Placid	Sandy, siliceous, hyperthermic Typic Humaquepts
Pomello	Sandy, siliceous, hyperthermic Arenic Haplohumods
Pomona	Sandy, siliceous, hyperthermic Ultic Haplaquods
Pompano	Siliceous, hyperthermic Typic Psammaquents
Popash	Loamy, siliceous, hyperthermic Grossarenic Umbraqualfs
Samsula	Sandy or sandy-skeletal, siliceous, dysic, hyperthermic Terric Medisaprists
Seaboard	Thermic, uncoated Lithic Quartzipsamments
Shadeville	Loamy, siliceous, thermic Arenic Hapludalfs
Smyrna	Sandy, siliceous, hyperthermic Aeric Haplaquods
Sparr	Loamy, siliceous, hyperthermic Grossarenic Paleudults
Tavares	Hyperthermic, uncoated Typic Quartzipsamments
Terra Ceia	Euic, hyperthermic Typic Medisaprists
Tidewater	Fine-loamy, siliceous, nonacid, thermic Typic Sulfaquents
Waccasassa	Loamy, siliceous, nonacid, thermic Lithic Haplaquepts
Wauchula	Sandy, siliceous, hyperthermic Ultic Haplaquods
Wekiva	Loamy, siliceous, thermic, shallow Aeric Ochraqualfs
Wulfert	Sandy or sandy-skeletal, siliceous, euic, hyperthermic Terric Sulfihemists
Zolfo	Sandy, siliceous, hyperthermic Grossarenic Entic Haplohumods

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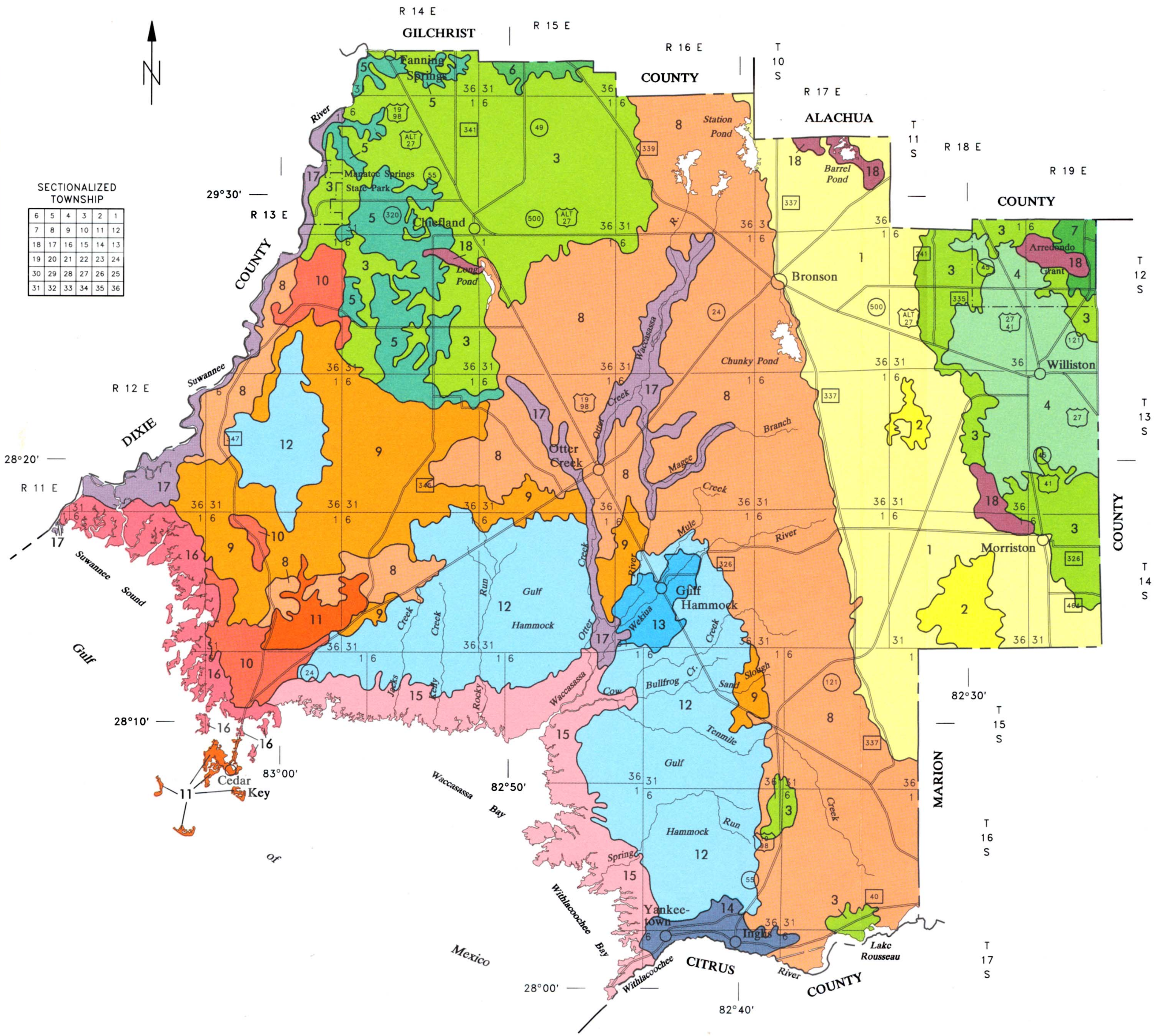


SOIL LEGEND*

NEARLY LEVEL TO GENTLY ROLLING, WELL DRAINED AND EXCESSIVELY DRAINED SOILS ON SANDY UPLANDS

1 Candler–Astatula–Apopka
2 Orlando

NEARLY LEVEL TO GENTLY SLOPING, POORLY DRAINED TO EXCESSIVELY DRAINED SOILS ON SANDY AND LOAMY UPLANDS

3 Otela–Candler–Tavares
4 Jonesville–Pedro–Shadeville
5 Otela–Jonesville–Seaboard
6 Millhopper–Bonneau
7 Sparr–Ft. Green–Bivans

NEARLY LEVEL TO GENTLY ROLLING, VERY POORLY DRAINED TO MODERATELY WELL DRAINED SOILS ON FLATWOODS AND SANDY UPLANDS

8 Smyrna–Placid–Samsula
9 Holopaw–EauGallie–Popash
10 Orsino–Myakka–Placid
11 Cassia–Pomello–Orsino

NEARLY LEVEL, VERY POORLY DRAINED TO SOMEWHAT POORLY DRAINED SOILS ON THE COASTAL LIMESTONE SHELF

12 Wekiva–Demory–Waccasassa
13 Aripeka–Matmon–Chobee
14 Broward–Lutterloh–Zolfo

NEARLY LEVEL, VERY POORLY DRAINED SOILS IN TIDAL MARSHES

15 Tidewater–Cracker
16 Tidewater–Wulfert

NEARLY LEVEL, VERY POORLY DRAINED AND POORLY DRAINED SOILS ON FLOOD PLAINS AND LOW FLATS

17 Gator–Chobee–Terra Ceia
18 Hicoria–Placid–Holopaw

*The units on this legend are described in the text under the heading "General Soil Map Units".

Compiled 1991

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
UNIVERSITY OF FLORIDA
INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES
AGRICULTURAL EXPERIMENT STATIONS
SOIL SCIENCE DEPARTMENT
FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

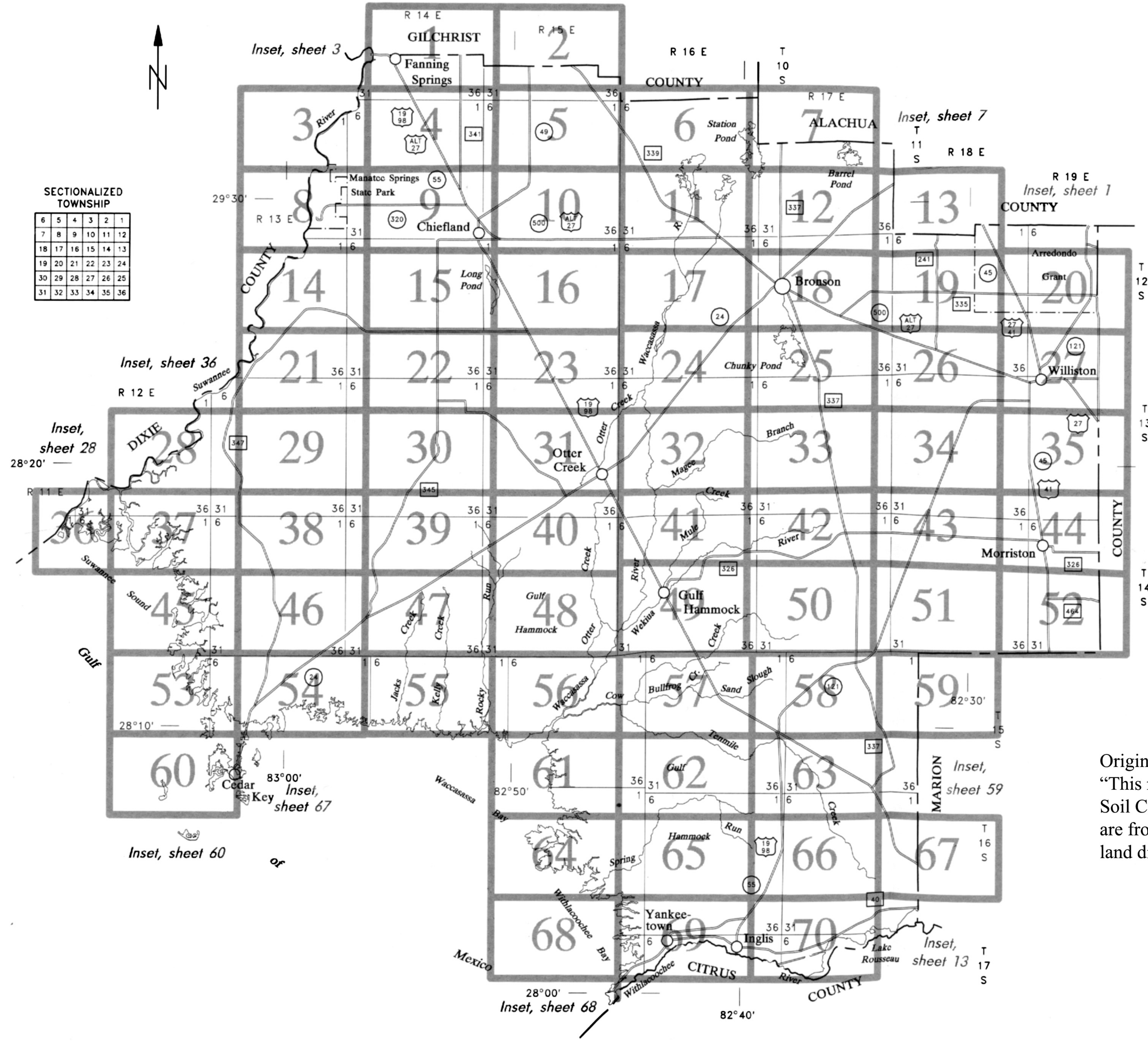
GENERAL SOIL MAP
LEVY COUNTY, FLORIDA

Scale 1:316,800

1 0 1 2 3 4 5 Miles

1 0 5 10 Km

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



Original text from each map sheet:

"This map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1979–1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned."

INDEX TO MAP SHEETS

LEVY COUNTY, FLORIDA

Scale 1:316,800

1 0 1 2 3 4 5 Miles

1 0 5 10 Km

SOIL LEGEND

The publication symbols are numerical. An alphabetical legend will also be shown on the legend page preceding the map sheets. Soil map unit names without a slope phase are either nearly level, or they are miscellaneous areas.

SYMBOL	NAME
2	Tavares fine sand, 1 to 5 percent slopes
3	Orsino fine sand, 0 to 8 percent slopes
4	Millhopper fine sand, 1 to 5 percent slopes
5	Immokalee fine sand
6	Candler fine sand, 1 to 5 percent slopes
7	Candler-Apopka complex, 1 to 5 percent slopes
8	Smyrna fine sand
9	Pomona fine sand
10	Placid fine sand
11	Placid and Samsula soils, depressional
12	Otela-Candler complex, 1 to 5 percent slopes
13	Wekiva fine sand
14	Shadeville-Otela complex, 1 to 5 percent slopes
15	Holopaw-Pineda complex, frequently flooded
16	Chobee-Gator complex, frequently flooded
17	Adamsville fine sand, 0 to 5 percent slopes
18	Wauchula fine sand
19	Sparr fine sand
21	Pompano fine sand
22	Holopaw fine sand
23	Zolfo sand
24	Terra Ceia muck, depressional
25	Pits and Dumps
26	Gator and Terra Ceia soils, frequently flooded
27	Placid and Popash soils, depressional
29	Chobee-Bradenton complex, frequently flooded
31	Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes
32	Otela-Tavares complex, 1 to 5 percent slopes
33	Wulfert muck, frequently flooded
34	Cassia-Pomello complex
35	Pineda fine sand, limestone substratum
37	Myakka mucky sand, occasionally flooded
38	Myakka sand
39	Waccasassa-Demory complex, flooded
40	Pineda fine sand
41	Demory sandy clay loam, occasionally flooded
42	Ousley-Albany complex, occasionally flooded
43	Tidewater mucky clay, frequently flooded
45	Cracker mucky clay, frequently flooded
46	Chobee fine sandy loam, limestone substratum, frequently flooded
48	Lutterloh-Moriah complex, 0 to 5 percent slopes
49	Hicoria fine sand
50	Hicoria loamy fine sand, depressional
51	Ft. Green-Bivans complex, 2 to 5 percent slopes
55	Pedro-Jonesville-Shadeville complex, 0 to 5 percent slopes
56	Moriah-Bushnell-Mabel, limestone substratum, complex, 0 to 5 percent slopes
57	Paola fine sand, gently rolling
58	Boca-Holopaw, limestone substratum, complex
59	Aripeka-Matmon complex
60	EauGallie-Holopaw complex, limestone substratum
62	Millhopper-Bonneau complex, 1 to 5 percent slopes
65	Sparr-Lochloosa complex, 1 to 5 percent slopes
66	Levyville-Shadeville complex, 2 to 5 percent slopes
67	Immokalee, limestone substratum-Janney complex
68	Myakka, limestone substratum-Immokalee complex
69	Broward-Lutterloh, limestone substratum, complex
70	Hallandale-Boca-Holopaw complex
71	Pender loamy fine sand
72	Levyville-Hague complex
73	Orlando fine sand, 1 to 5 percent slopes
74	Arents, 0 to 5 percent slopes
75	Orlando fine sand, 5 to 8 percent slopes
76	Astatula fine sand, 1 to 8 percent slopes
77	Candler fine sand, 5 to 8 percent slopes
78	Micanopy loamy fine sand, 1 to 5 percent slopes

SYMBOL	NAME
17	Adamsville fine sand, 0 to 5 percent slopes
74	Arents, 0 to 5 percent slopes
59	Aripeka-Matmon complex
76	Astatula fine sand, 1 to 8 percent slopes
58	Boca-Holopaw, limestone substratum, complex
69	Broward-Letterloh, limestone substratum, complex
7	Candler-Apopka complex, 1 to 5 percent slopes
6	Candler fine sand, 1 to 5 percent slopes
77	Candler fine sand, 5 to 8 percent slopes
34	Cassia-Pomello complex
46	Chobee fine sandy loam, limestone substratum, frequently flooded
29	Chobee-Bradenton complex, frequently flooded
16	Chobee-Gator complex, frequently flooded
45	Cracker mucky clay, frequently flooded
41	Demory sandy clay loam, occasionally flooded
60	EauGallie-Holopaw complex, limestone substratum
51	Ft. Green-Bivans complex, 2 to 5 percent slopes
26	Gator and Terra Ceia soils, frequently flooded
70	Hallandale-Boca-Holopaw complex
49	Hicoria fine sand
50	Hicoria loamy fine sand, depressional
22	Holopaw fine sand
15	Holopaw-Pineda complex, frequently flooded
5	Immokalee fine sand
67	Immokalee, limestone substratum-Janney complex
31	Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes
72	Levyville-Hague complex
66	Levyville-Shadeville complex, 2 to 5 percent slopes
48	Lutterloh-Moriah complex, 0 to 5 percent slopes
78	Micanopy loamy fine sand, 1 to 5 percent slopes
4	Millhopper fine sand, 1 to 5 percent slopes
62	Millhopper-Bonneau complex, 1 to 5 percent slopes
56	Moriah-Bushmell-Mabel, limestone substratum, complex, 0 to 5 percent slopes
38	Myakka sand
37	Myakka mucky sand, occasionally flooded
68	Myakka, limestone substratum-Immokalee complex
73	Orlando fine sand, 1 to 5 percent slopes
75	Orlando fine sand, 5 to 8 percent slopes
3	Orsino fine sand, 0 to 8 percent slopes
12	Otela-Candler complex, 1 to 5 percent slopes
32	Otela-Tavares complex, 1 to 5 percent slopes
42	Ousley-Albany complex, occasionally flooded
57	Paola fine sand, gently rolling
55	Pedro-Jonesville -Shadeville complex, 0 to 5 percent slopes
71	Pender loamy fine sand
40	Pineda fine sand
35	Pineda fine sand, limestone substratum
25	Pits and Dumps
10	Placid fine sand
27	Placid and Popash soils, depressional
11	Placid and Samsula soils, depressional
9	Pomona fine sand
21	Pompano fine sand
14	Shadeville-Otela complex, 1 to 5 percent slopes
8	Smyrna fine sand
19	Sparr fine sand
65	Sparr-Lochloosa complex, 1 to 5 percent slopes
2	Tavares fine sand, 1 to 5 percent slopes
24	Terra Ceia muck, depressional
43	Tidewater mucky clay, frequently flooded
39	Waccasassa-Demory complex, flooded
18	Wauchula fine sand
13	Wekiva fine sand
33	Wulfert muck, frequently flooded
23	Zolfo sand

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state, or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline and neatline

AD HOC BOUNDARY (label) — Davis Airstrip

- Small airport, airfield, park, oilfield, cemetery, or flood pool — FLOOD POOL LINE

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER
(sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate — 173
- Federal — 287
- State — 52
- County, farm or ranch — 1283

RAILROAD

POWER TRANSMISSION LINE
(normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or Small — water
(Named where applicable) — w

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban area) (occupied)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water, w
- Intermittent — int, i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — 2, 65

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

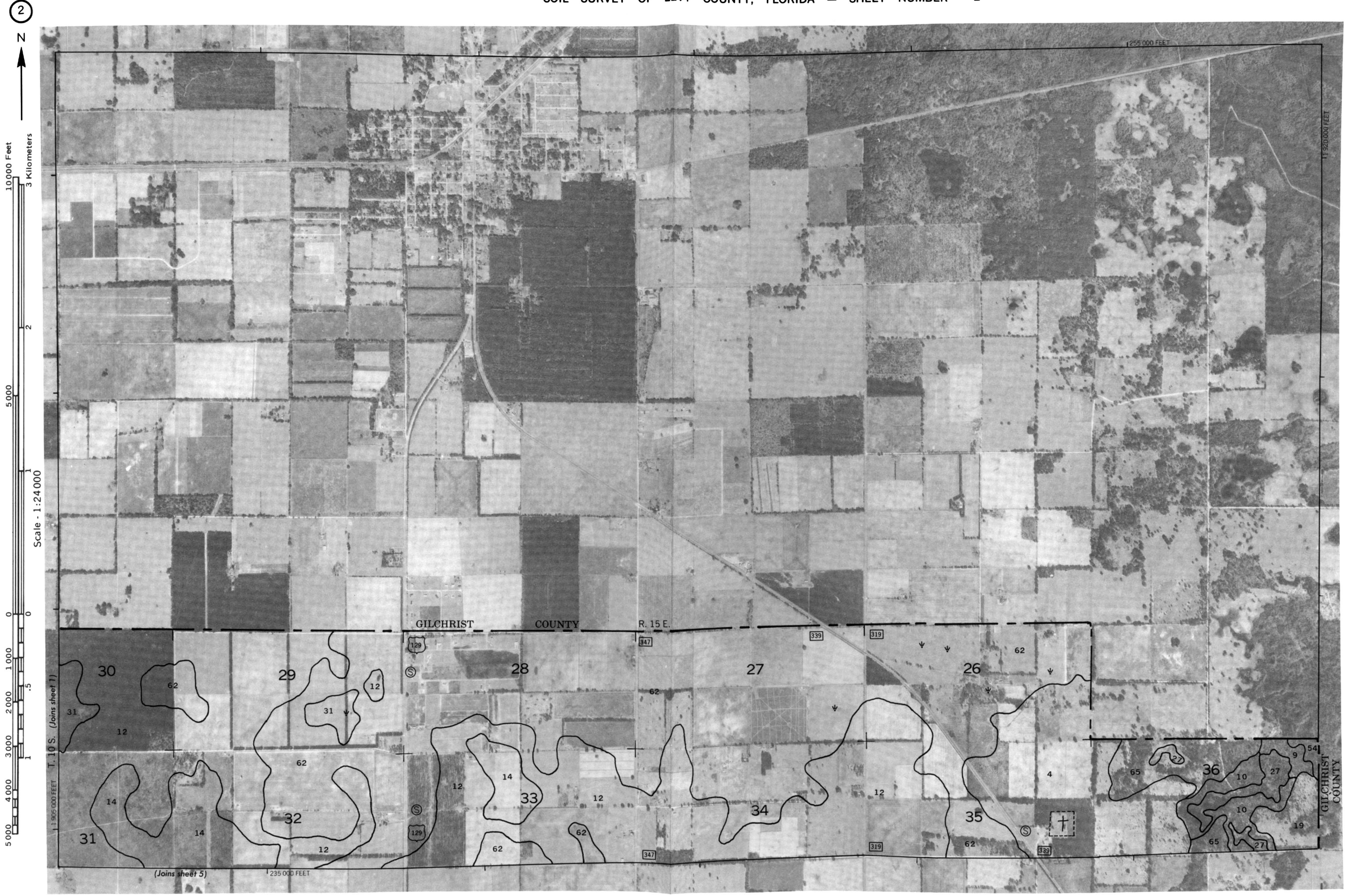
DEPRESSION OR SINK

SOIL SAMPLE (normally not shown)

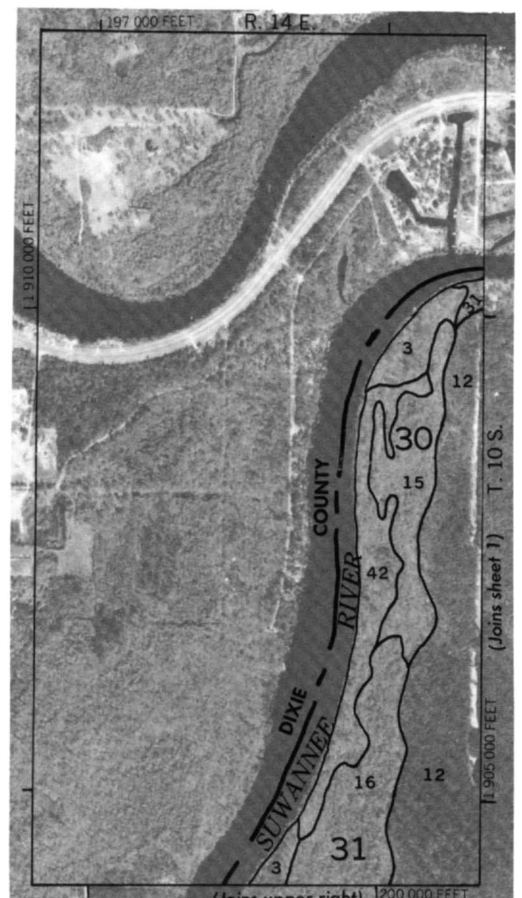
MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

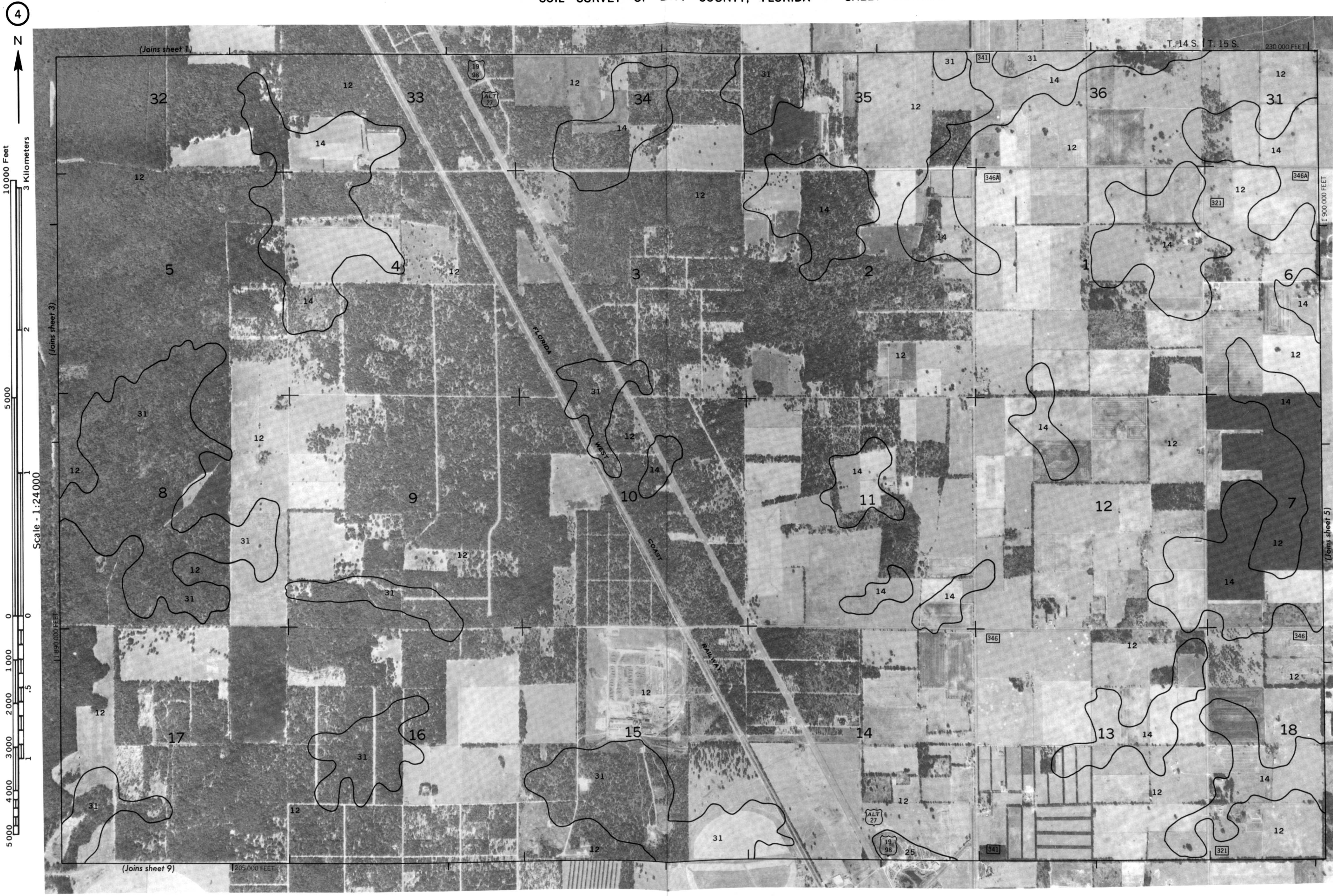

1
N
ALACHUA COUNTY
MARION COUNTY
PRIEST PRAIRIE
R. 18 E. R. 19 E.
T. 12 S.
CSXT RAILWAY
(Joins sheet 13)
(Joins sheet 20)
4000 AND 5000-FOOT GRID TICKS
GILCHRIST COUNTY
DIXIE COUNTY
R. 14 E. R. 15 E.
T. 10 S.
FLORIDA WEST COAST RAILWAY
(Joins inset, sheet 3)
(Joins sheet 2)
(Joins sheet 4)
10000 Feet
3 Kilometers
Scale - 1:24000


2
N
10000 Feet
3 Kilometers
Scale - 1:24000
GILCHRIST COUNTY
R. 15 E.
T. 10 S.
(Joins sheet 1)
(Joins sheet 5)
235 000 FEET
255 000 FEET
1 905 000 FEET
1 920 000 FEET
GILCHRIST COUNTY
30
29
28
27
26
31
32
33
34
35
36
62
12
14
4
65
10
27
9
54
19
129
347
339
319

LEVY COUNTY, FLORIDA NO. 3

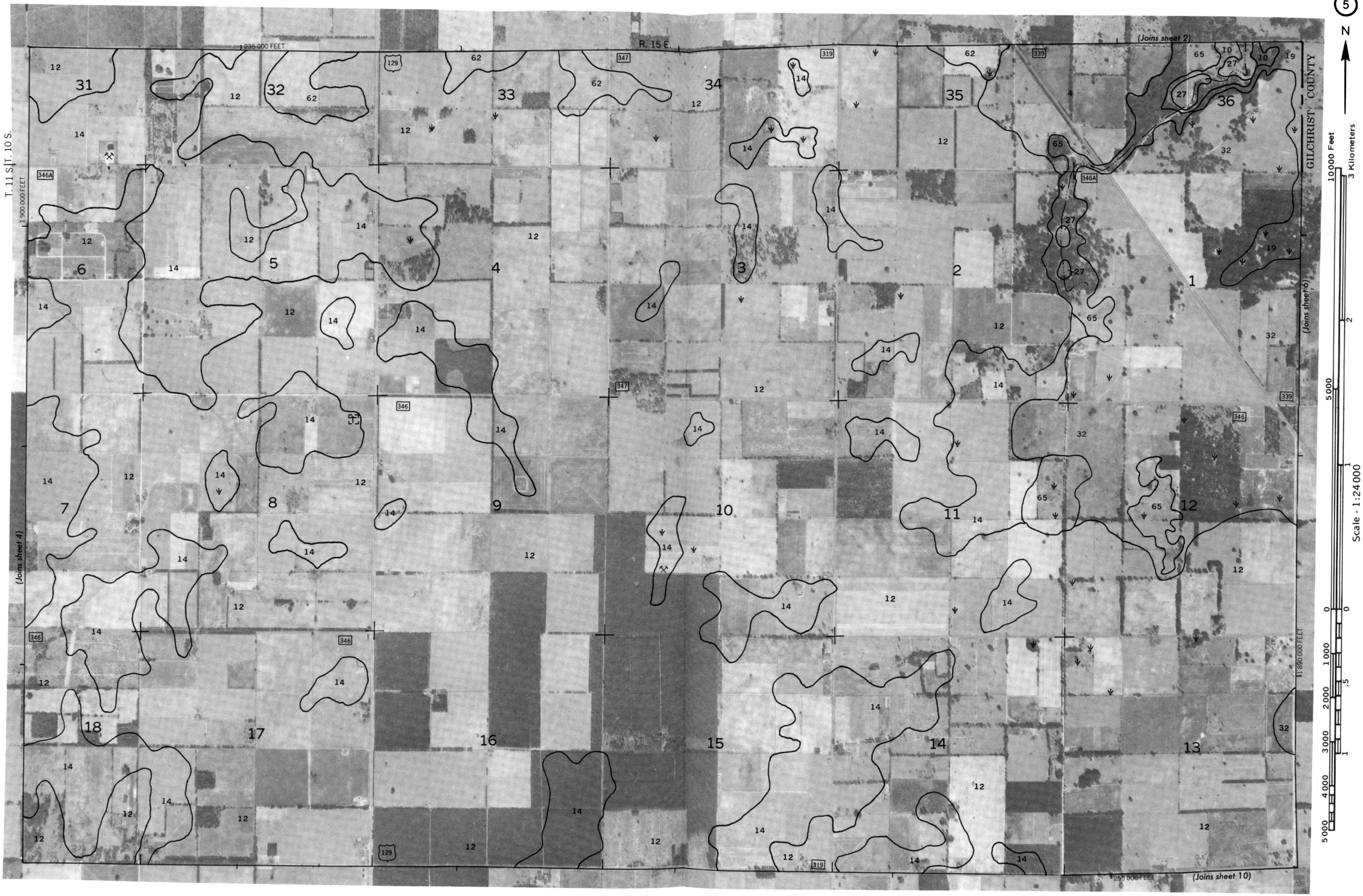


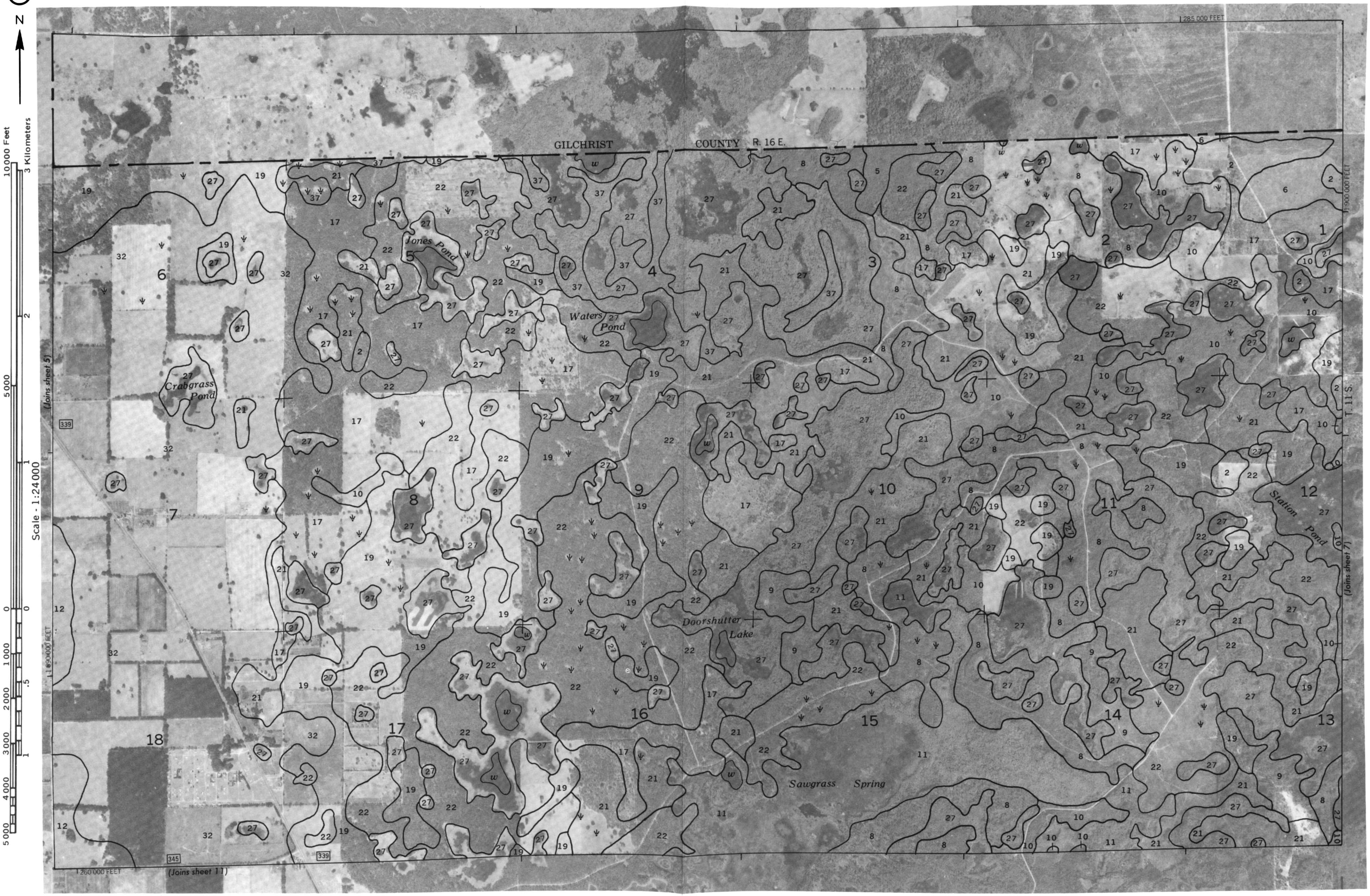
3000 AND 5000-FOOT GRID TICKS

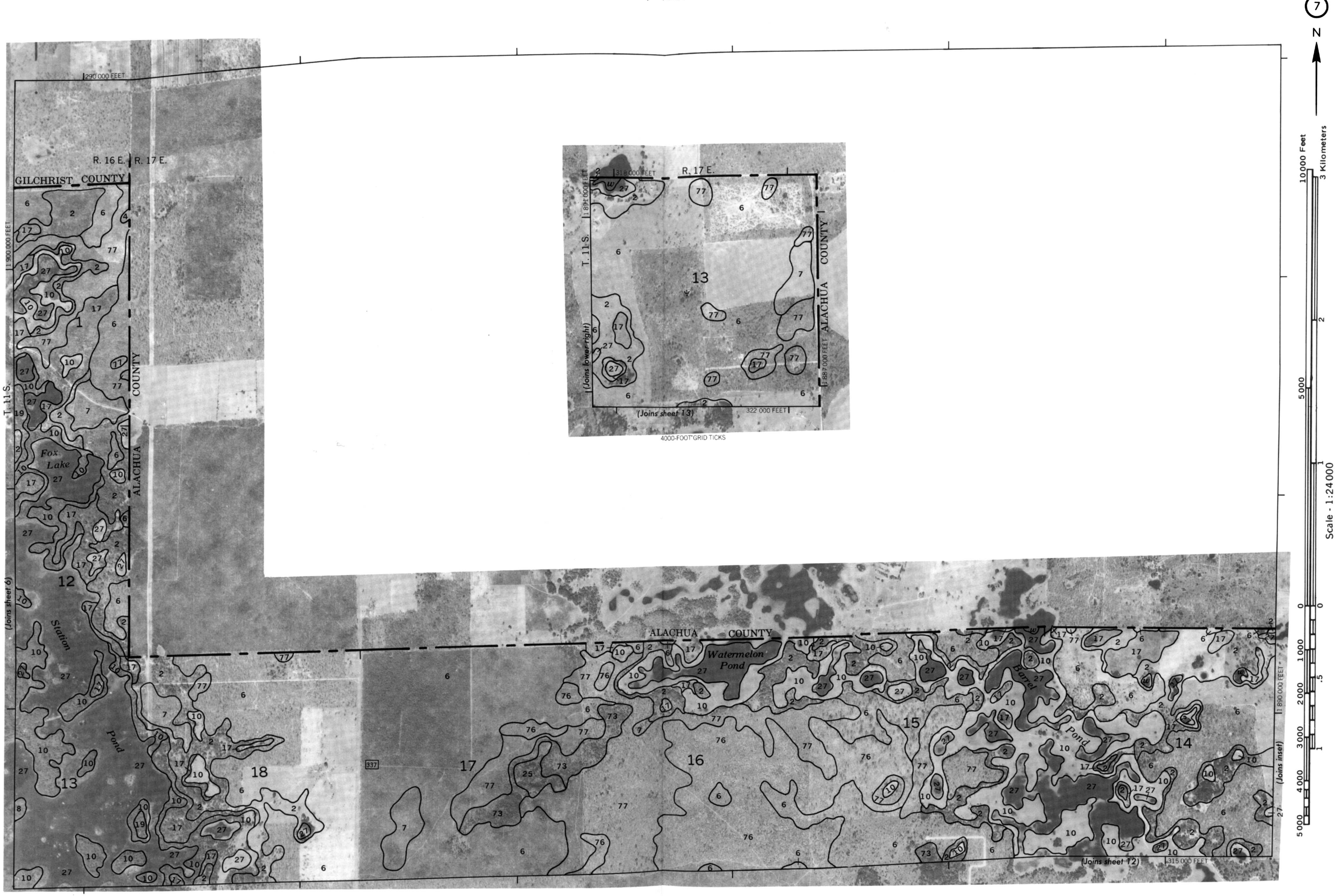


LEVY COUNTY, FLORIDA NO. 4

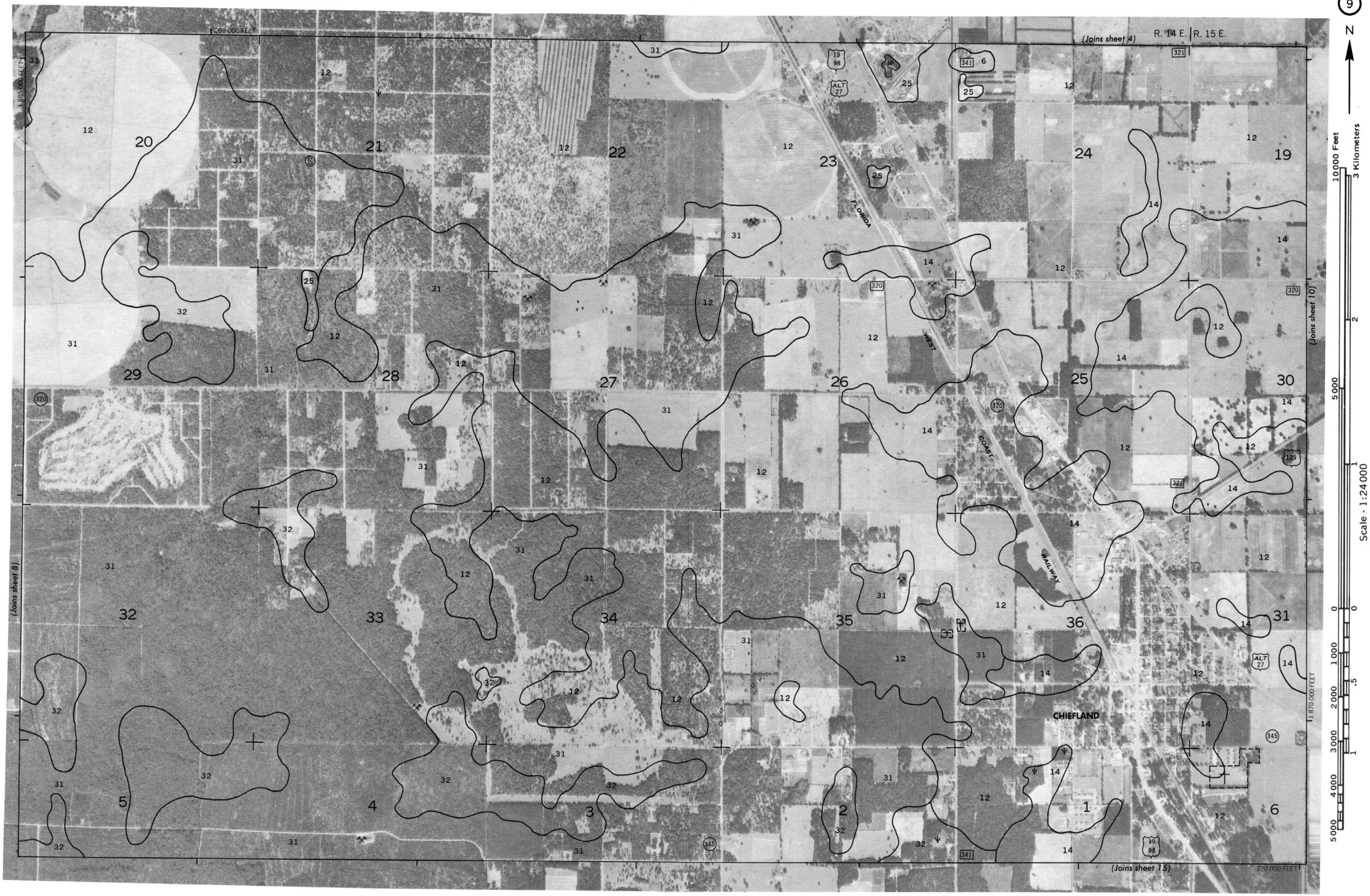
LEVY COUNTY, FLORIDA NO. 5




N
Scale - 1:24 000
10 000 Feet
3 Kilometers
GILCHRIST COUNTY R. 16 E.
285 000 FEET
1 900 000 FEET
1 890 000 FEET
260 000 FEET
T. 11 S.
(Joins sheet 5)
(Joins sheet 7)
(Joins sheet 11)
Jones Pond
Waters Pond
Crabgrass Pond
Doorshutter Lake
Station Pond
Sawgrass Spring
339
345


7
N
290 000 FEET
R. 16 E.
R. 17 E.
GILCHRIST COUNTY
1 900 000 FEET
T. 11 S.
ALACHUA COUNTY
Fox Lake
Station Pond
(Joins sheet 6)
318 000 FEET
1 891 000 FEET
1 887 000 FEET
322 000 FEET
(Joins lower right)
(Joins sheet 13)
4000-FOOT GRID TICKS
Watermelon Pond
Barrel Pond
337
1 890 000 FEET
(Joins inset)
(Joins sheet 12)
315 000 FEET
10000 Feet
3 Kilometers
Scale - 1:24 000


8
N
10 000 Feet
3 Kilometers
Scale - 1:24 000
DIXIE COUNTY
(Joins sheet 3)
R. 13 E. | R. 14 E.
200 000 FEET
SUWANNEE RIVER
DIXIE COUNTY
MANATEE
SPRINGS
STATE
PARK
(Joins sheet 9)
T. 11 S.
T. 12 S.
(Joins sheet 14)
175 000 FEET
1 870 000 FEET
320
402
LEVY COUNTY, FLORIDA NO. 8



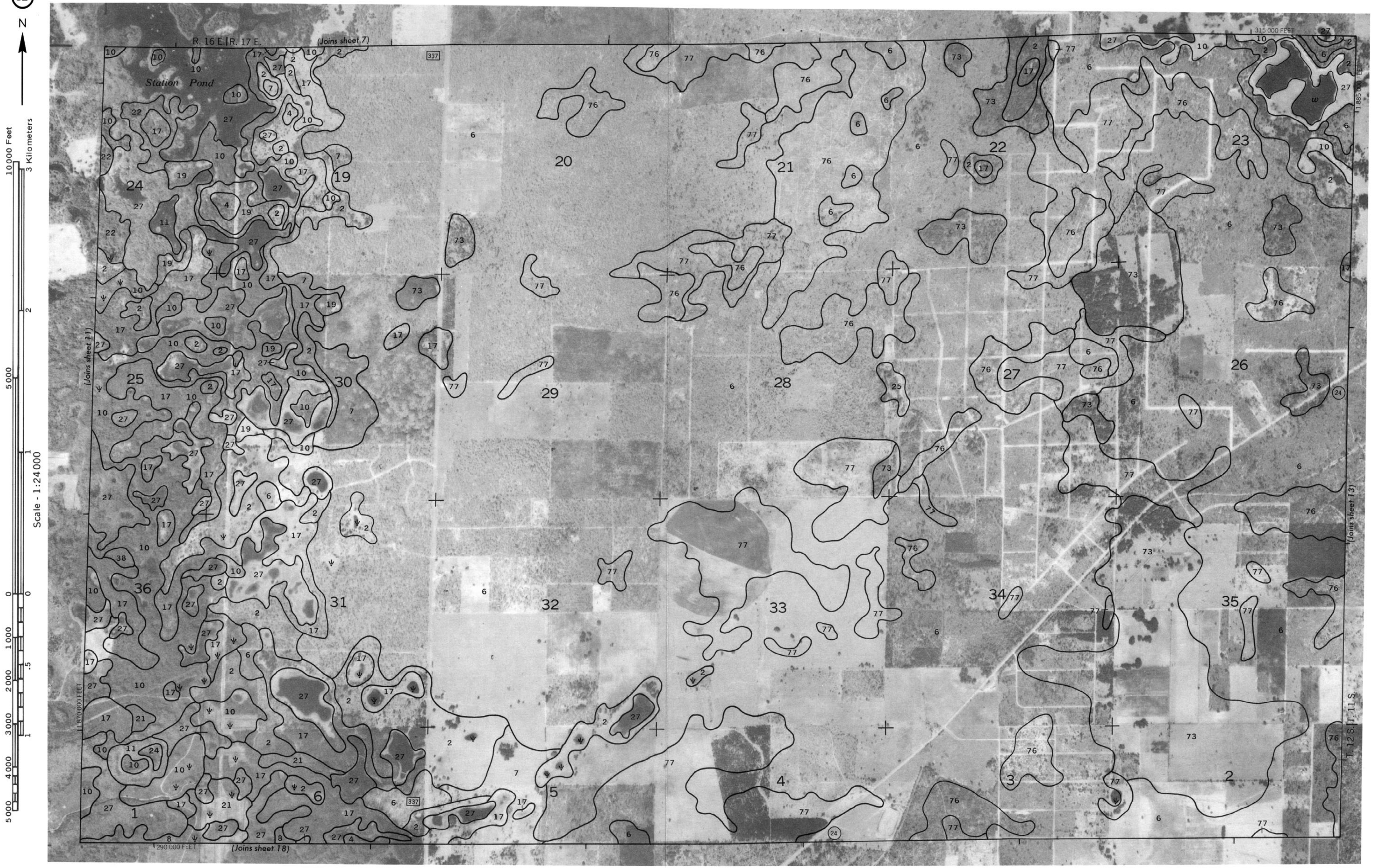
LEVY COUNTY, FLORIDA NO. 9

T. 12 S. | T. 11 S.

SOIL SURVEY OF LEVY COUNTY, FLORIDA — SHEET NUMBER 10

LEVY COUNTY, FLORIDA NO. 10

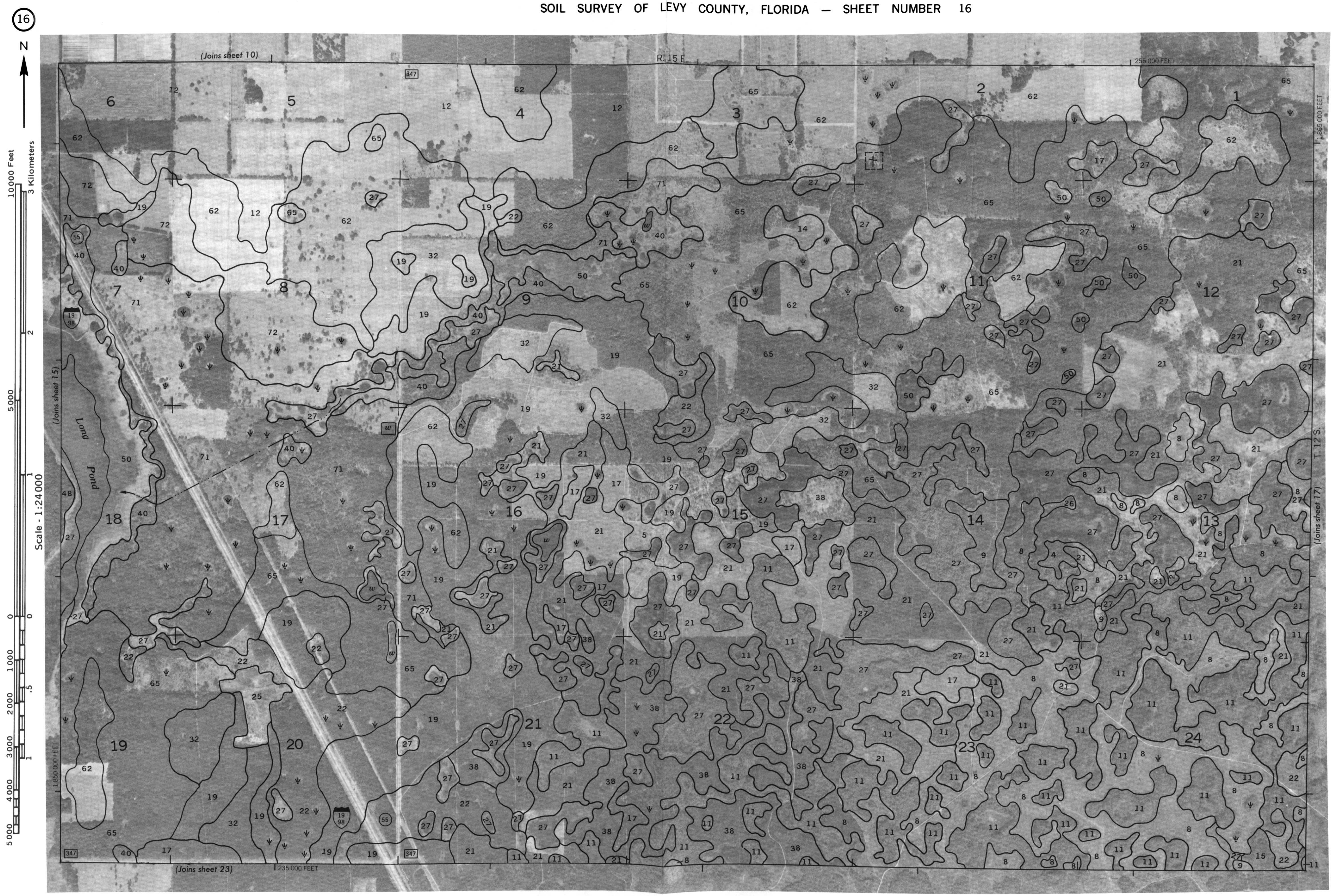
LEVY COUNTY, FLORIDA NO. 11


N
Scale - 1:24 000
10 000 Feet
3 Kilometers
R. 16 E. | R. 17 E.
(Joins sheet 7)
Station Pond
(Joins sheet 11)
(Joins sheet 13)
(Joins sheet 18)
315 000 FEET
290 000 FEET
1 870 000 FEET
1 885 000 FEET
T. 12 S. | T. 11 S.
337
24

LEVY COUNTY, FLORIDA NO. 13

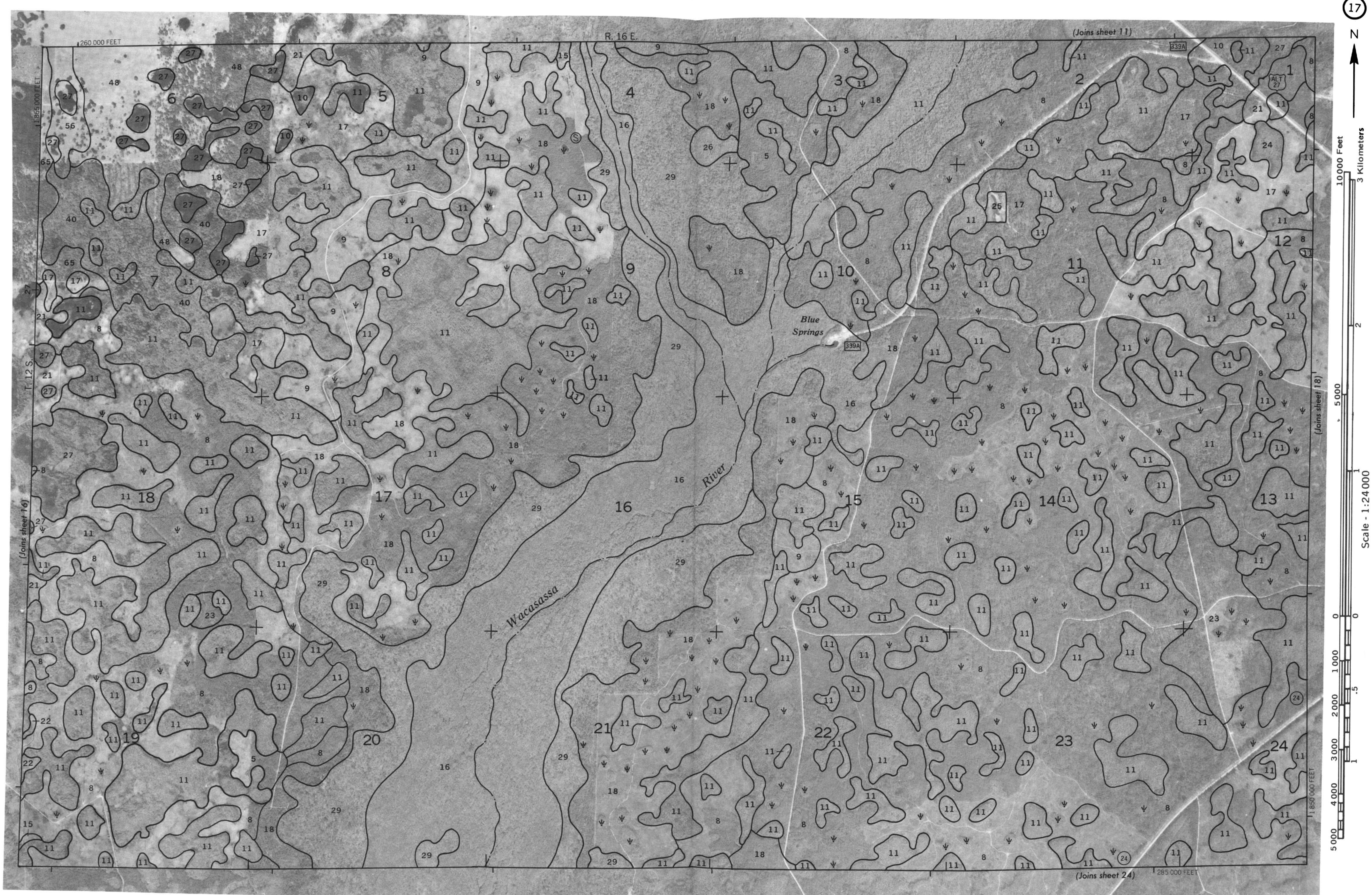

N
10 000 Feet
3 Kilometers
Scale - 1:24 000
(Joins sheet 8)
R. 13 E. | R. 14 E.
200 000 FEET
Lower Clay Landing
Sand Pond
Drummond Pond
Jack Landing
DIXIE COUNTY
SUWANNEE RIVER
T. 12 S.
(Joins sheet 15)
180 000 FEET
175 000 FEET
(Joins sheet 21)

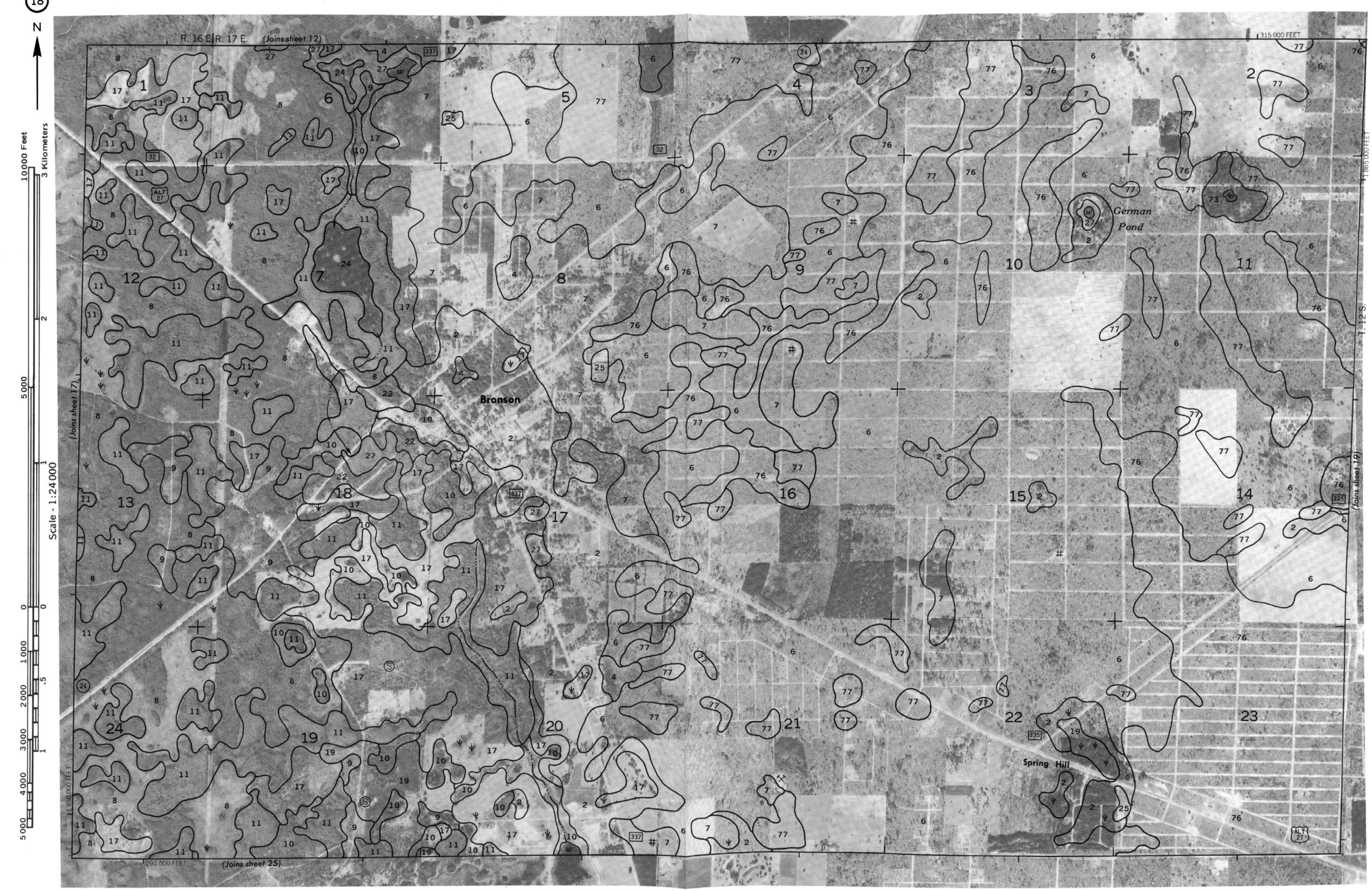
LEVY COUNTY, FLORIDA NO. 15



LEVY COUNTY, FLORIDA NO. 16

LEVY COUNTY, FLORIDA NO. 17





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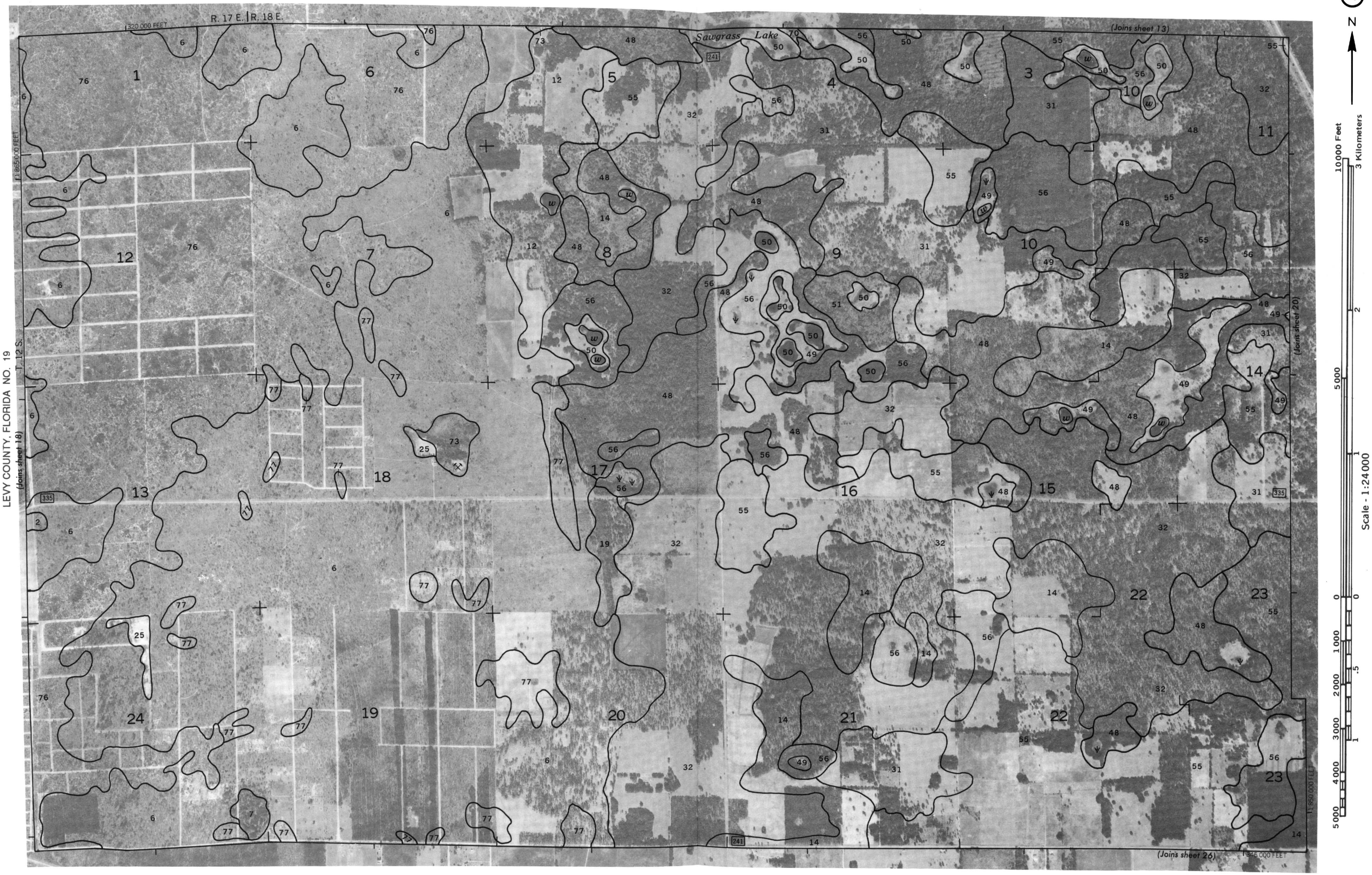
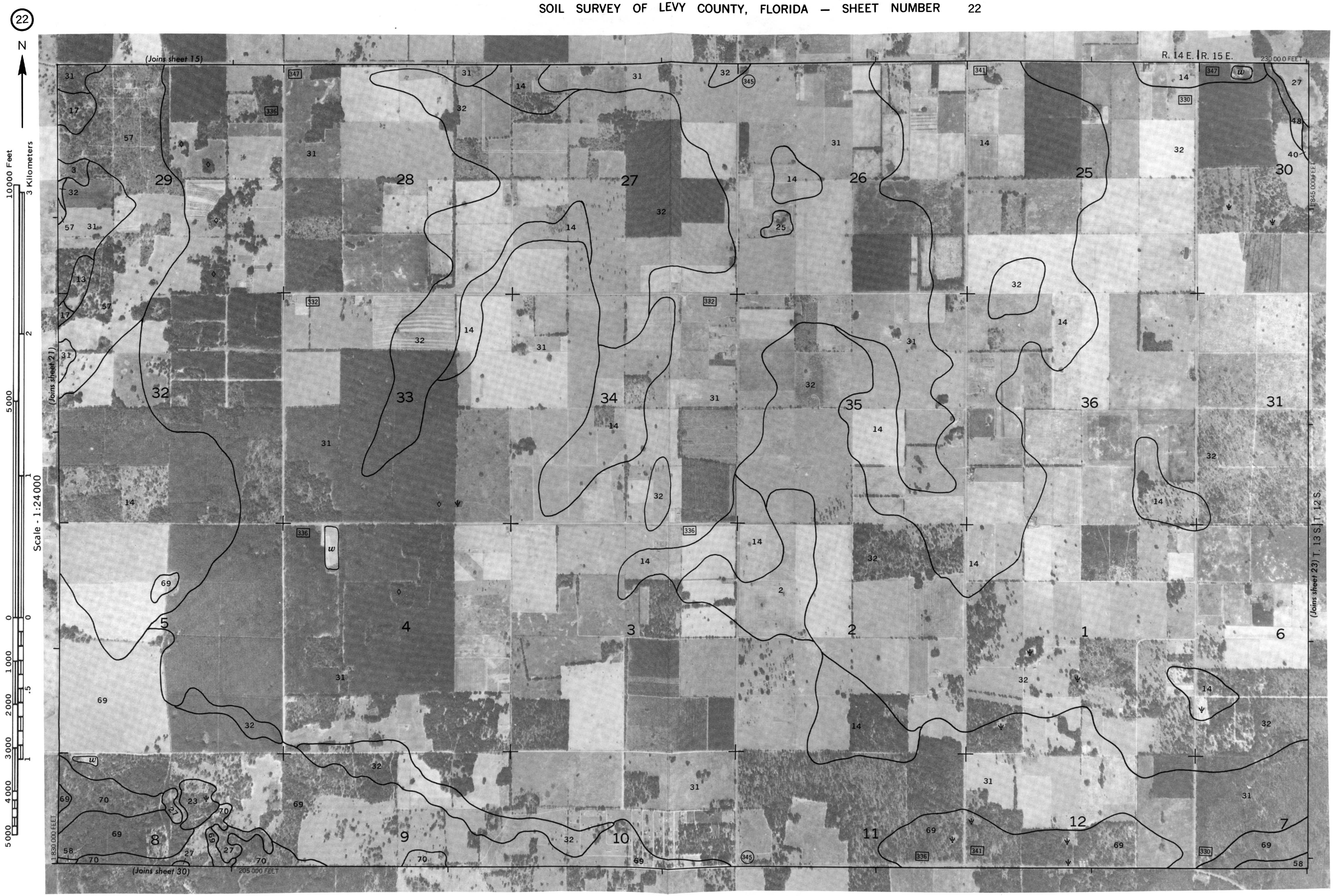

19
N
R. 17 E. | R. 18 E.
320 000 FEET
Sawgrass Lake
(Joins sheet 13)
(Joins sheet 20)
(Joins sheet 26)
(Joins sheet 18)
LEVY COUNTY, FLORIDA NO. 19
T. 12 S.
1 865 000 FEET
1 850 000 FEET
345 000 FEET
241
335
10 000 Feet
3 Kilometers
Scale - 1:24 000

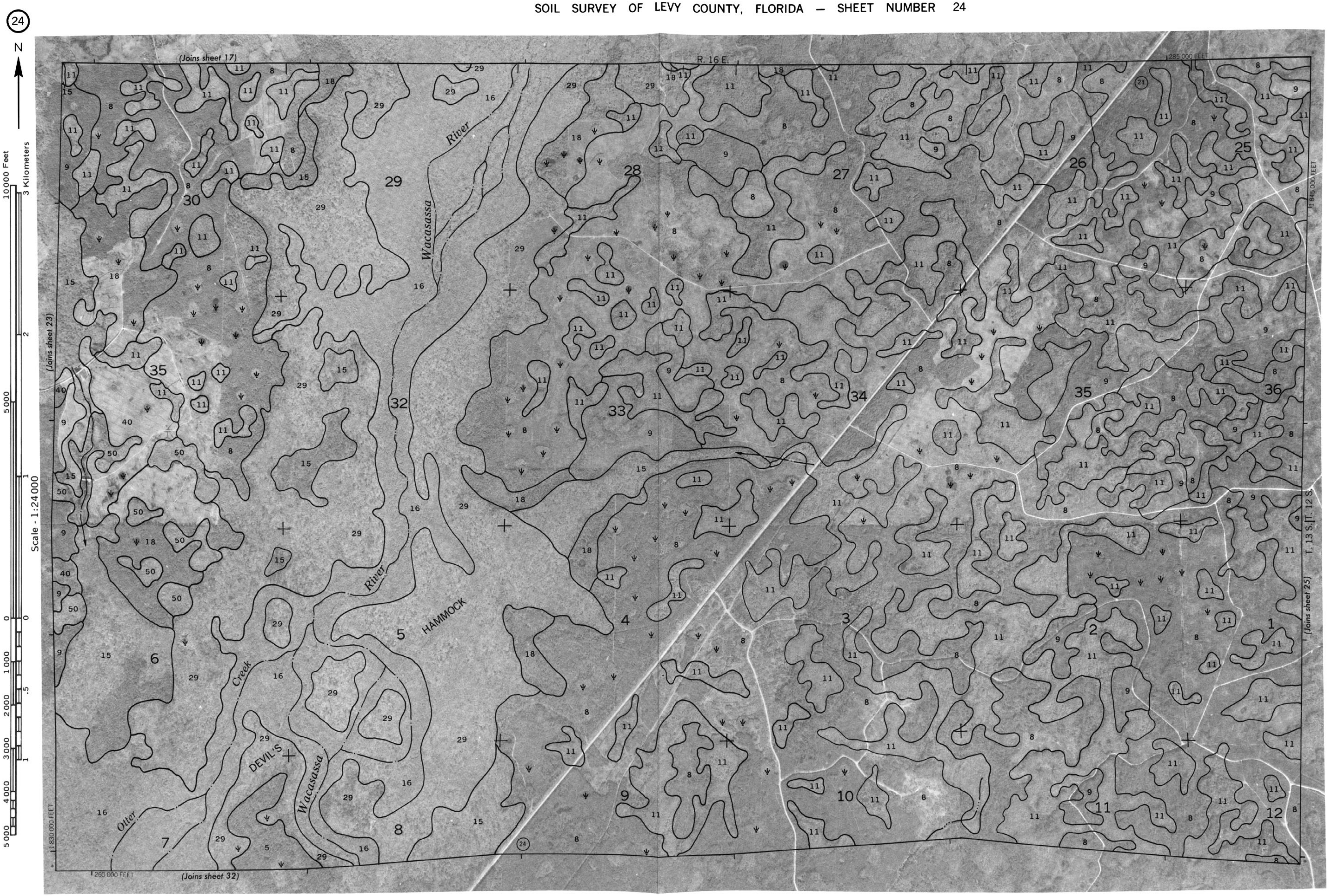
LEVY COUNTY, FLORIDA NO. 20

21

LEVY COUNTY, FLORIDA NO. 21


22
N
10000 Feet
3 Kilometers
Scale - 1:24000
(Joins sheet 15)
(Joins sheet 21)
(Joins sheet 23)
(Joins sheet 30)
R. 14 E. | R. 15 E.
230 000 FEET
845 000 FEET
T. 13 S. | T. 12 S.
205 000 FEET
1 830 000 FEET

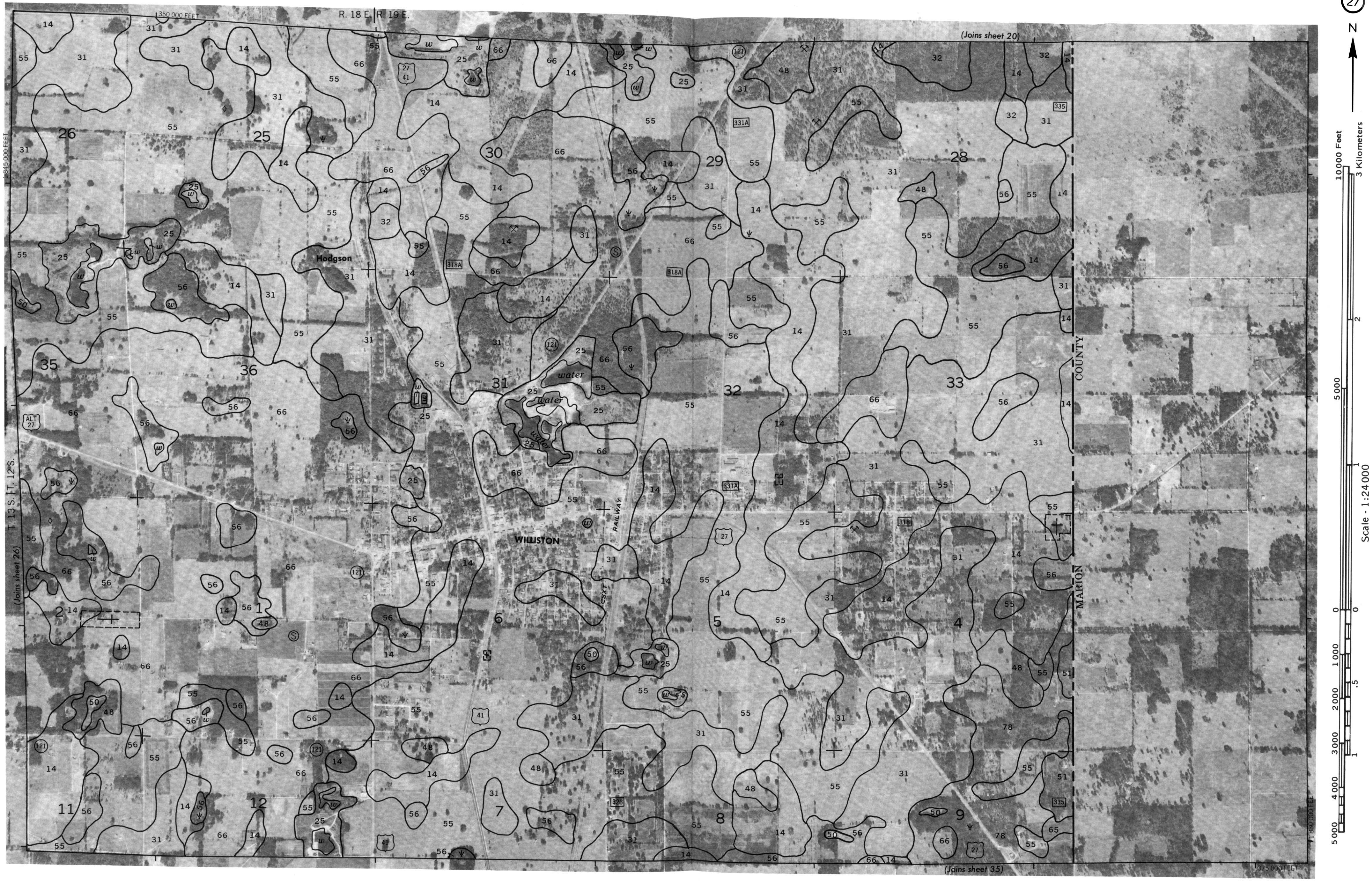
LEVY COUNTY, FLORIDA NO. 23



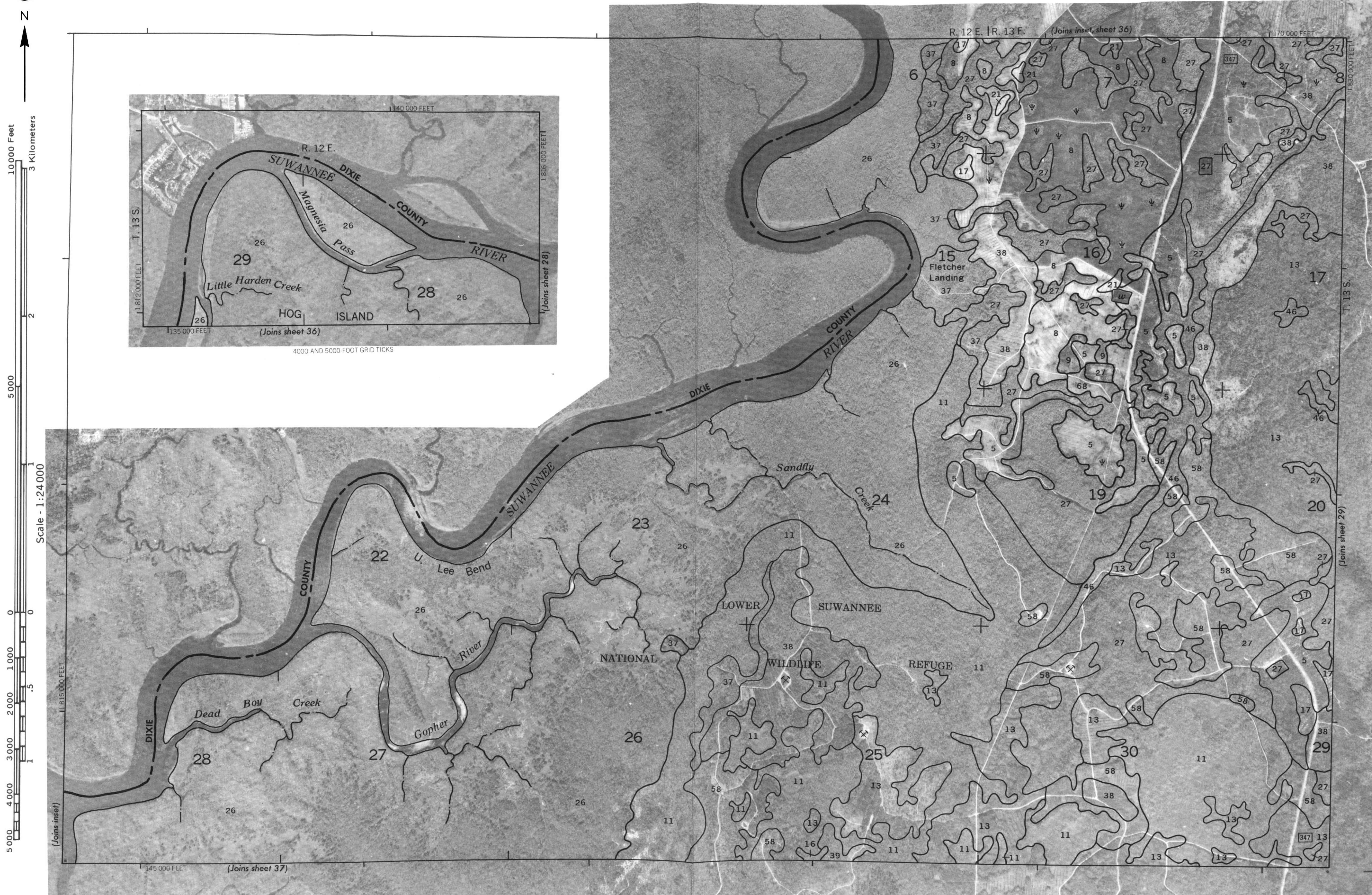
LEVY COUNTY, FLORIDA NO. 24


25
N
R. 16 E.
R. 17 E.
290 000 FEET
1 845 000 FEET
(Joins sheet 18)
(Joins sheet 26)
(Joins sheet 33)
(Joins sheet 24)
315 000 FEET
1 835 000 FEET
T. 12 S.
T. 13 S.
LEVY COUNTY, FLORIDA NO. 25
CHUNKY POND
Sand Pond
Deerpen Pond
water
ALT 27
337
343
10 000 Feet
3 Kilometers
5000
Scale - 1:24 000


26
N
10000 Feet
3 Kilometers
Scale - 1:24000
(Joins sheet 19)
R. 17 E. | R. 18 E.
(Joins sheet 25)
(Joins sheet 27)
(Joins sheet 34)
1 835 000 FEET
1 320 000 FEET
345 000 FEET
T. 13 S. | T. 12 S.
water
LEVY COUNTY, FLORIDA NO. 26


27
N
(Joins sheet 20)
(Joins sheet 35)
(Joins sheet 26)
R. 18 E. | R. 19 E.
LEVY COUNTY, FLORIDA NO. 27
T. 13 S. | T. 12 S.
Hodgson
WILLISTON
MARION
COUNTY
RAILWAY
water
10000 Feet
3 Kilometers
Scale - 1:24000

28



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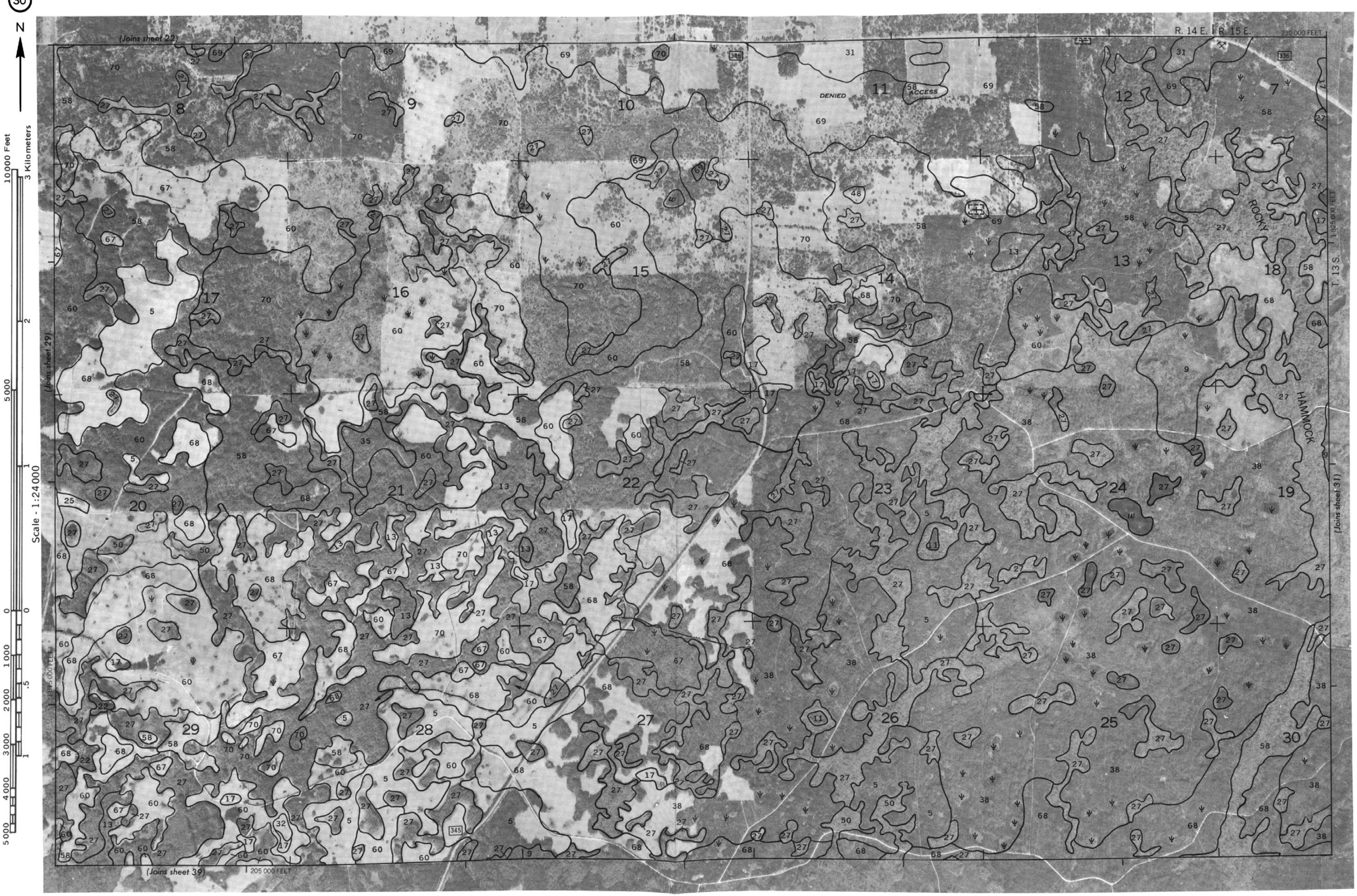
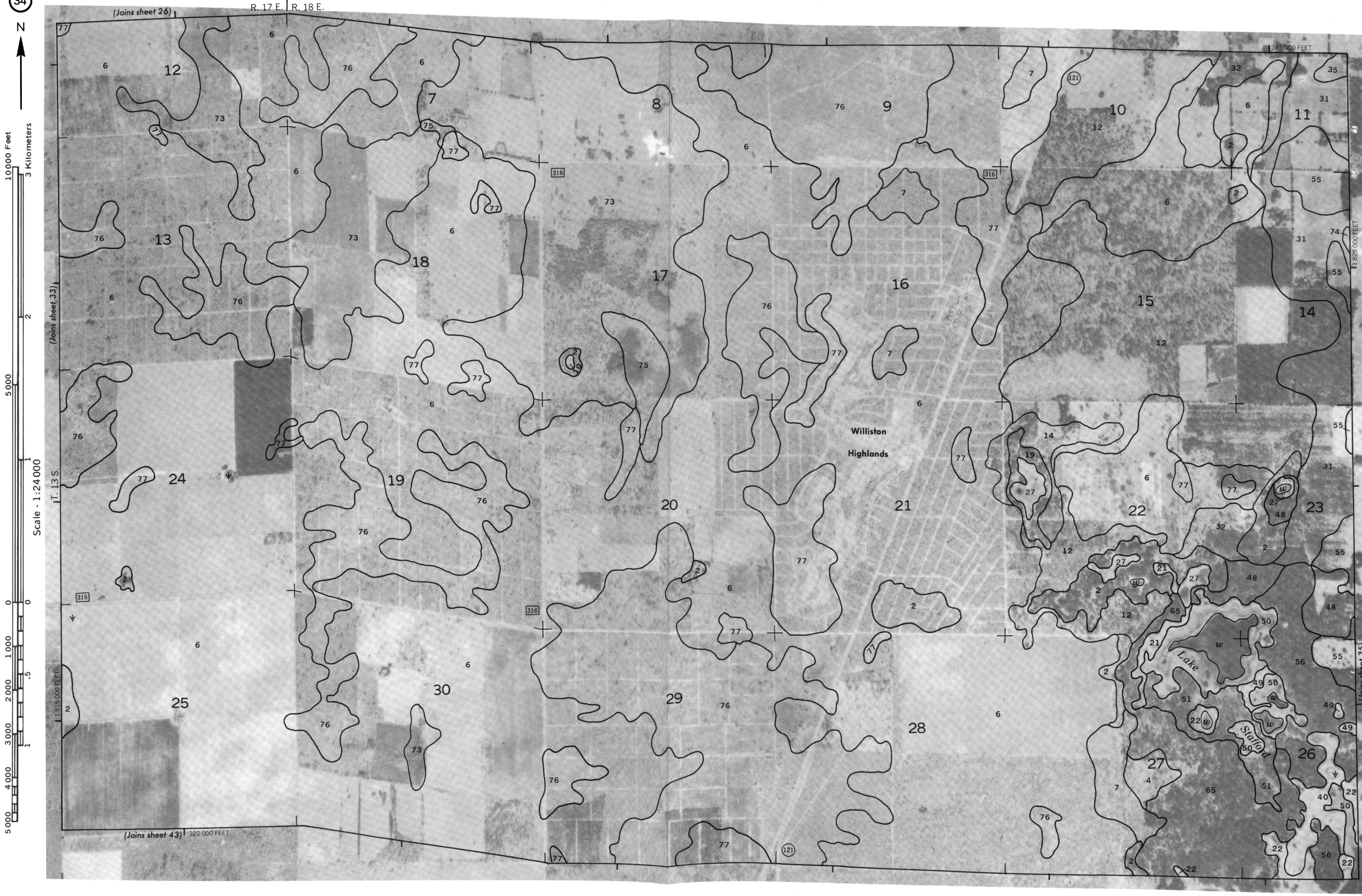
LEVY COUNTY, FLORIDA NO. 29


N
10 000 Feet
3 Kilometers
Scale - 1:24 000
(Joins sheet 22)
(Joins sheet 29)
(Joins sheet 31)
(Joins sheet 39)
R. 14 E. | R. 15 E.
230 000 FEET
205 000 FEET
T. 13 S.
DENIED ACCESS
ROCKY HAMMOCK
345
336


31
LEVY COUNTY, FLORIDA NO. 31
(Joins sheet 23)
(Joins sheet 32)
(Joins sheet 40)
(Joins sheet 30)
230 000 FEET
255 000 FEET
1 825 000 FEET
1 815 000 FEET
R. 15 E.
T. 13 S.
DEVIL'S HAMMOCK
Otter Creek
Otter
Creek
water
N
10 000 Feet
3 Kilometers
Scale - 1:24 000

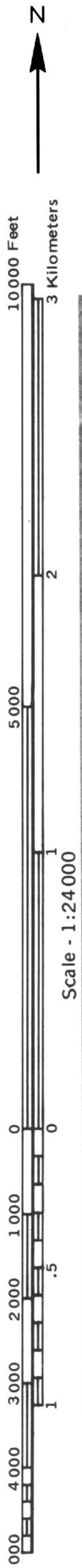

N
10000 Feet
3 Kilometers
Scale - 1:24000
(Joins sheet 24)
(Joins sheet 31)
(Joins sheet 33)
(Joins sheet 41)
DEVIL'S HAMMOCK
Wacasassa River
Magee Branch
R. 16 E.
T. 13 S.
285 000 FEET
825 000 FEET
815 000 FEET
260 000 FEET

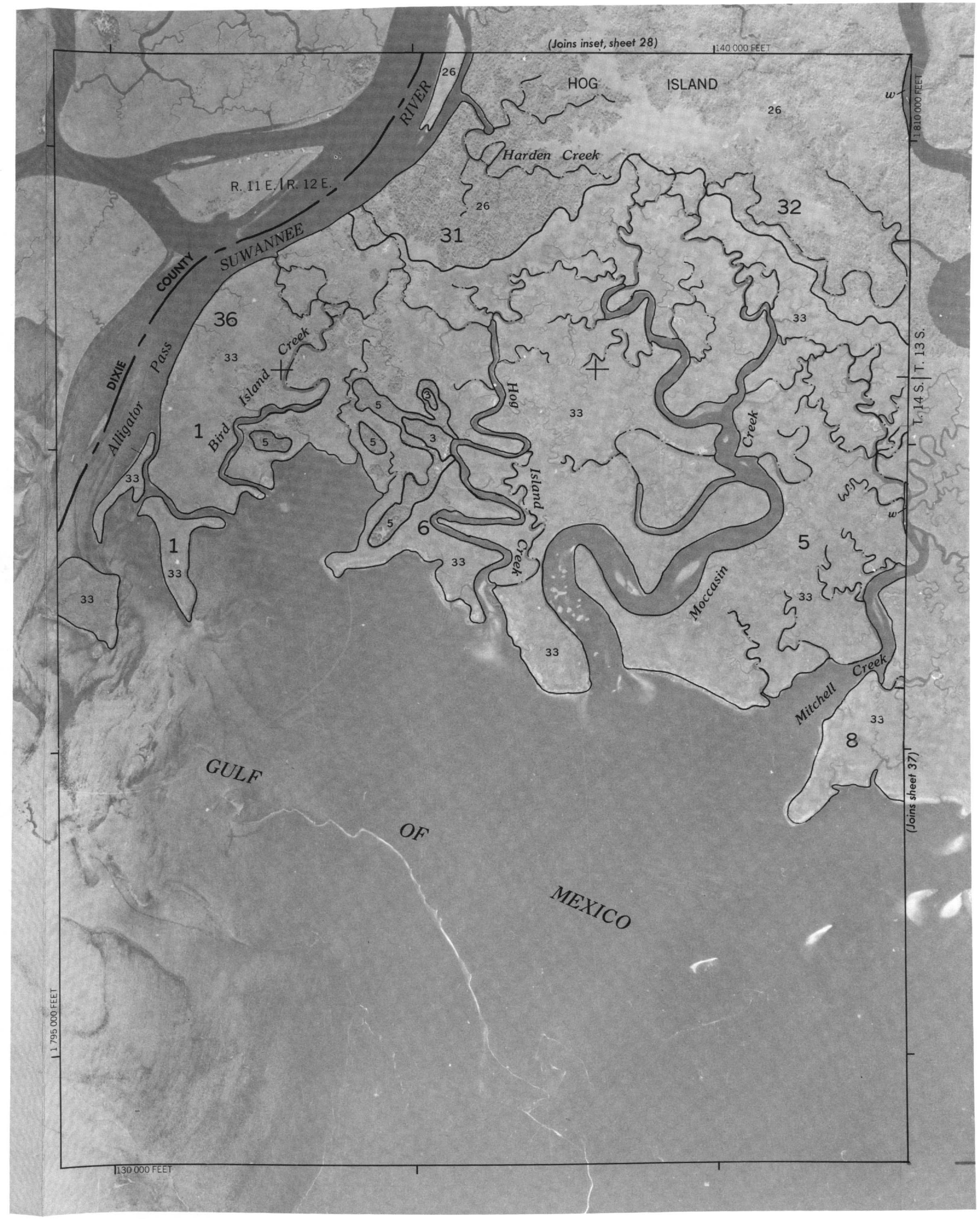
LEVY COUNTY, FLORIDA NO. 33


N
10 000 Feet
3 Kilometers
Scale - 1:24 000
(Joins sheet 26)
R. 17 E.
R. 18 E.
345 000 FEET
(Joins sheet 33)
T. 13 S.
1 825 000 FEET
1 815 000 FEET
(Joins sheet 35)
(Joins sheet 43)
320 000 FEET
Williston
Highlands
Lake
Stafford
316
121


35
R. 18 E.
R. 19 E.
350 000 FEET
(Joins sheet 27)
WILLISTON MUNICIPAL AIRPORT
T. 13 S.
1 825 000 FEET
LEVY COUNTY, FLORIDA NO. 35
(Joins sheet 34)
CSXT RAILWAY
Montbrook
MARION COUNTY
1 815 000 FEET
375 000 FEET
(Joins sheet 44)
N
10000 Feet
3 Kilometers
Scale - 1:24000

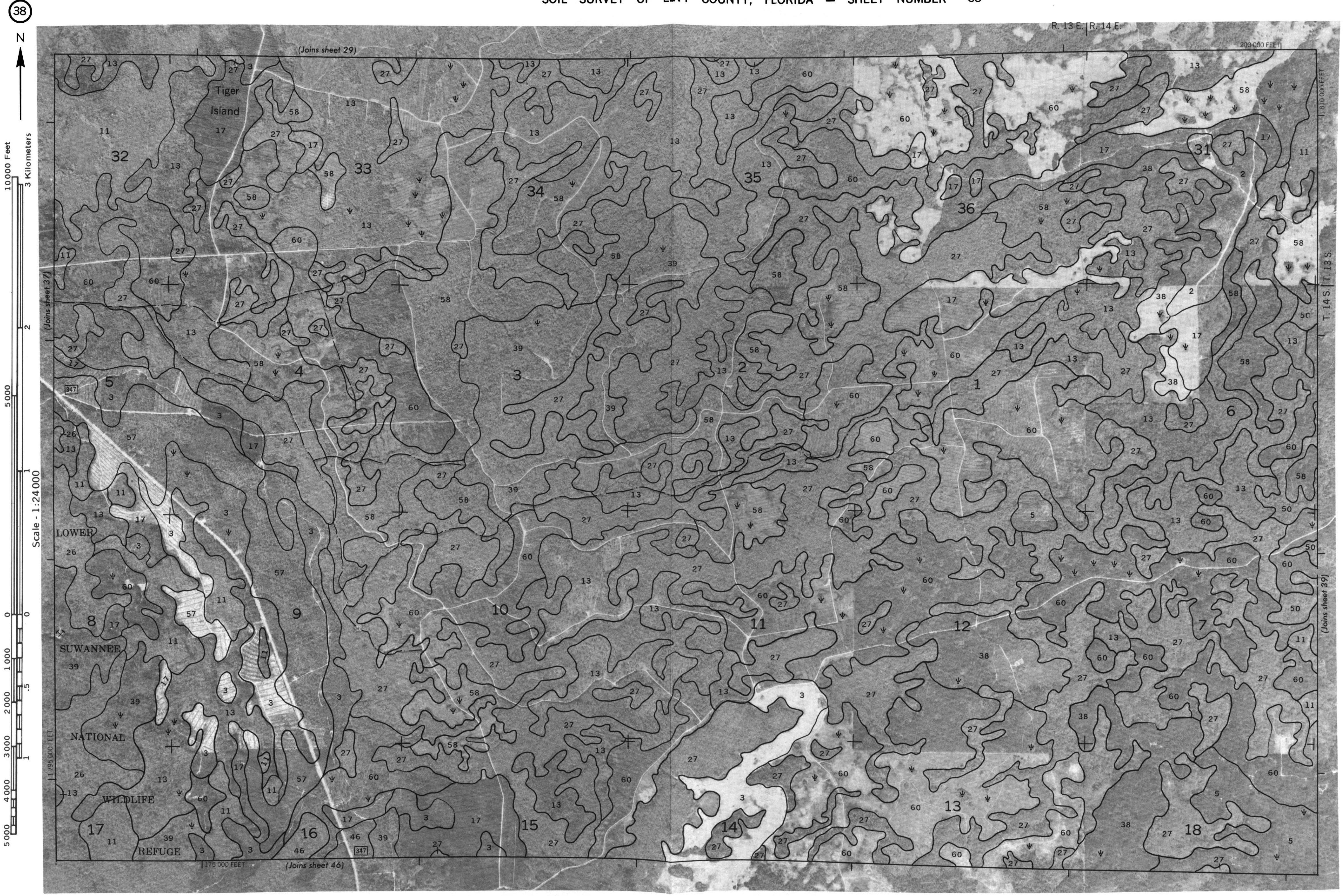
36





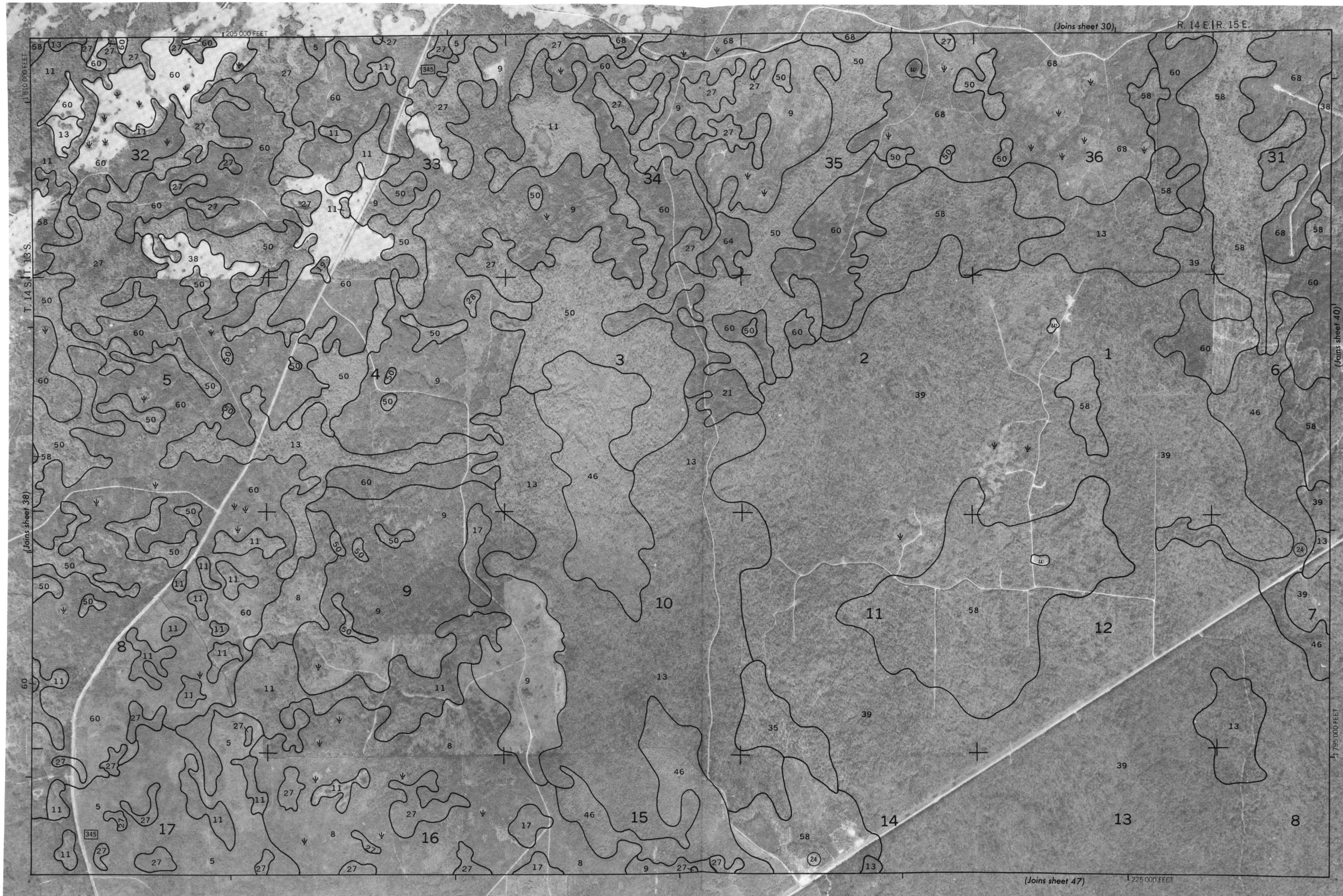
LEVY COUNTY, FLORIDA NO. 36


37
N
(Joins sheet 28)
(Joins sheet 36)
(Joins sheet 38)
(Joins sheet 45)
R. 13 E. | R. 13 E.
T. 14 S. | T. 13 S.
145 000 FEET
1 810 000 FEET
170 000 FEET
1 795 000 FEET
GULF OF MEXICO
LOWER SUWANNEE NATIONAL WILDLIFE REFUGE
HOG ISLAND
East Pass
Sand Creek
Bull Creek
Mitchell Creek
Dan May Creek
Weeks
Fisher Creek
Barnett Creek
McCormick Creek
Trout Creek
Big
347
Scale - 1:24 000
10000 Feet
3 Kilometers


38
N
10000 Feet
3 Kilometers
Scale - 1:24000
(Joins sheet 29)
(Joins sheet 37)
(Joins sheet 39)
(Joins sheet 46)
R. 13 E. R. 14 E.
T. 14 S. T. 13 S.
Tiger Island
LOWER SUWANNEE NATIONAL WILDLIFE REFUGE
347
175 000 FEET
200 000 FEET
1 810 000 FEET
1 795 000 FEET

39

LEVY COUNTY, FLORIDA NO. 39



N

Scale - 1:24 000

10 000 Feet
5000
0
1000
2000
3000
4000
5000

3 Kilometers
2
1
.5
0
1

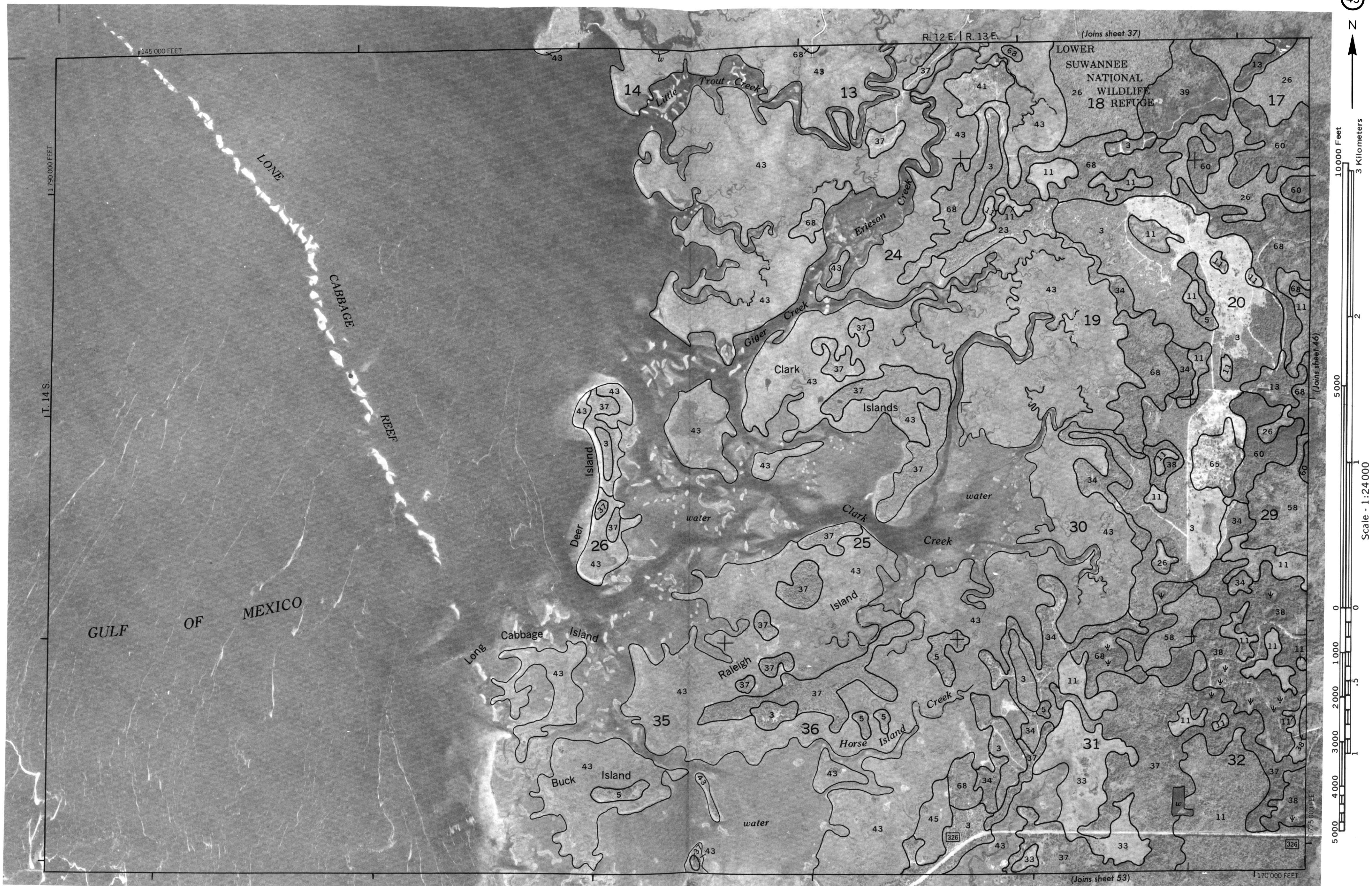
LEVY COUNTY, FLORIDA NO. 40

LEVY COUNTY, FLORIDA NO. 41


N
10000 Feet
3 Kilometers
Scale - 1:24000
R. 16 E. | R. 17 E.
(Joins sheet 33)
(Joins sheet 41)
(Joins sheet 50)
(Joins sheet 43)
T. 14 S. | T. 13 S.
Black Prong Creek
Wekiva Run
Wekiva Springs
Lake Marion
315 000 FEET
1 810 000 FEET
1 795 000 FEET
290 000 FEET


43
N
R. 17 E. | R. 18 E.
320 000 FEET
1 810 000 FEET
T. 14 S. | T. 13 S.
(Joins sheet 34)
Lake Stafford
(Joins sheet 42)
(Joins sheet 44)
(Joins sheet 51)
345 000 FEET
1 795 000 FEET
326
121
10 000 Feet
3 Kilometers
Scale - 1:24 000


44
N
10 000 Feet
3 Kilometers
Scale - 1:24 000
R. 18 E. R. 19 E.
(Joins sheet 35)
(Joins sheet 43)
(Joins sheet 52)
375 000 FEET
1 810 000 FEET
1 795 000 FEET
350 000 FEET
Lake Stafford
Morriston
CSXT
RAILWAY
T. 14 S. T. 13 S.
MARION
COUNTY
LEVY COUNTY, FLORIDA NO. 44


(Joins sheet 37)
R. 12 E. | R. 13 E.
LOWER SUWANNEE NATIONAL WILDLIFE REFUGE
145 000 FEET
1 790 000 FEET
T. 14 S.
LONE CABBAGE REEF
GULF OF MEXICO
Little Trout Creek
Ericson Creek
Giger Creek
Clark Islands
Deer Island
water
Clark Creek
Island
Long Cabbage Island
Raleigh
Horse Island
Creek
Buck Island
326
(Joins sheet 46)
(Joins sheet 53)
170 000 FEET
N
10000 Feet
5000
0
3 Kilometers
2
1
0
Scale - 1:24000
1000
2000
3000
4000
5000
.5
1

46


N
LOWER SUWANNEE
NATIONAL WILDLIFE REFUGE
(Joins sheet 38)
(Joins sheet 45)
(Joins sheet 47)
(Joins sheet 54)
R. 13 E. | R. 14 E.
T. 14 S.
200 000 FEET
175 000 FEET
10000 Feet
3 Kilometers
Scale - 1:24000

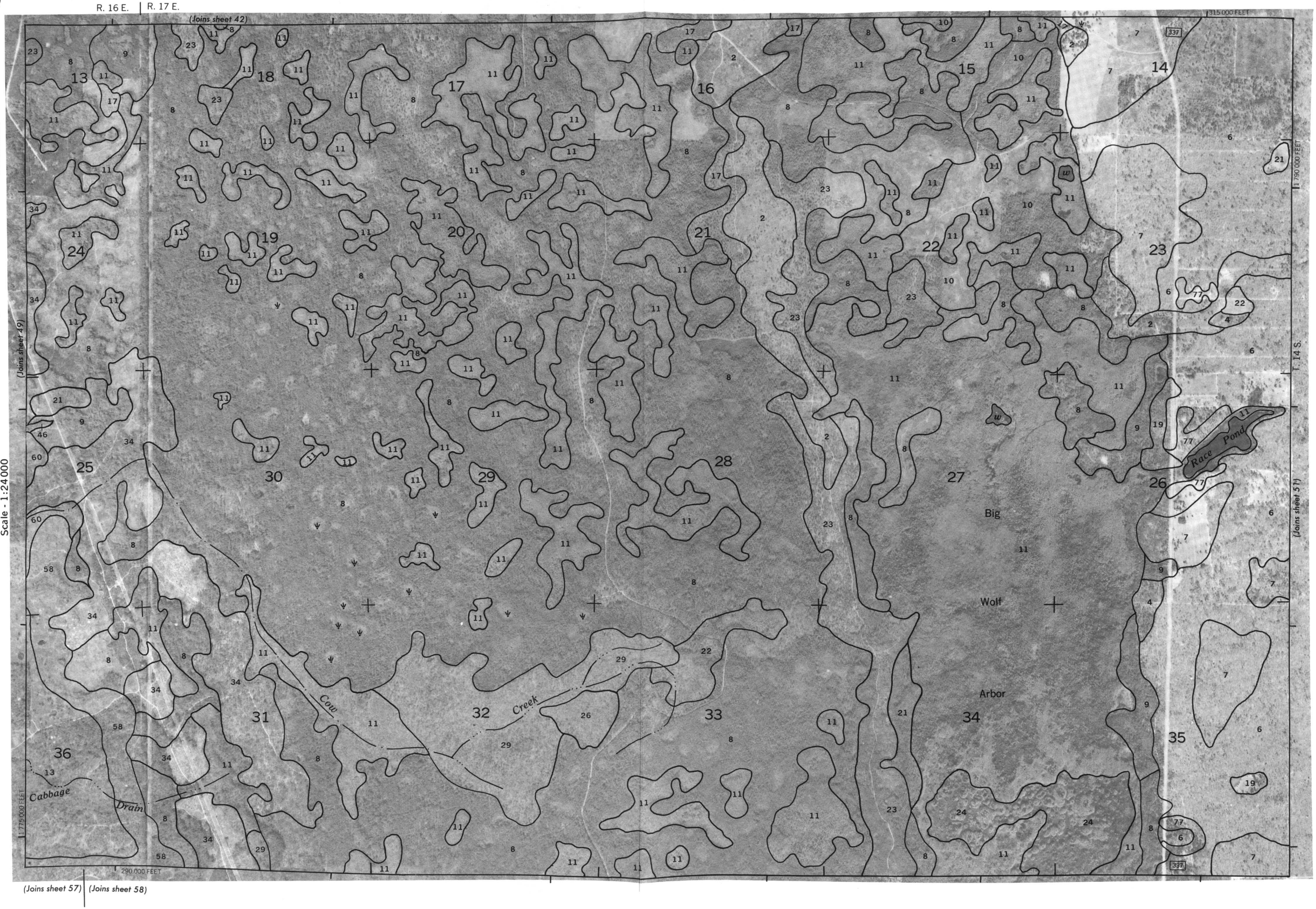
LEVY COUNTY, FLORIDA NO. 47

T. 15 S. | T. 14 S.

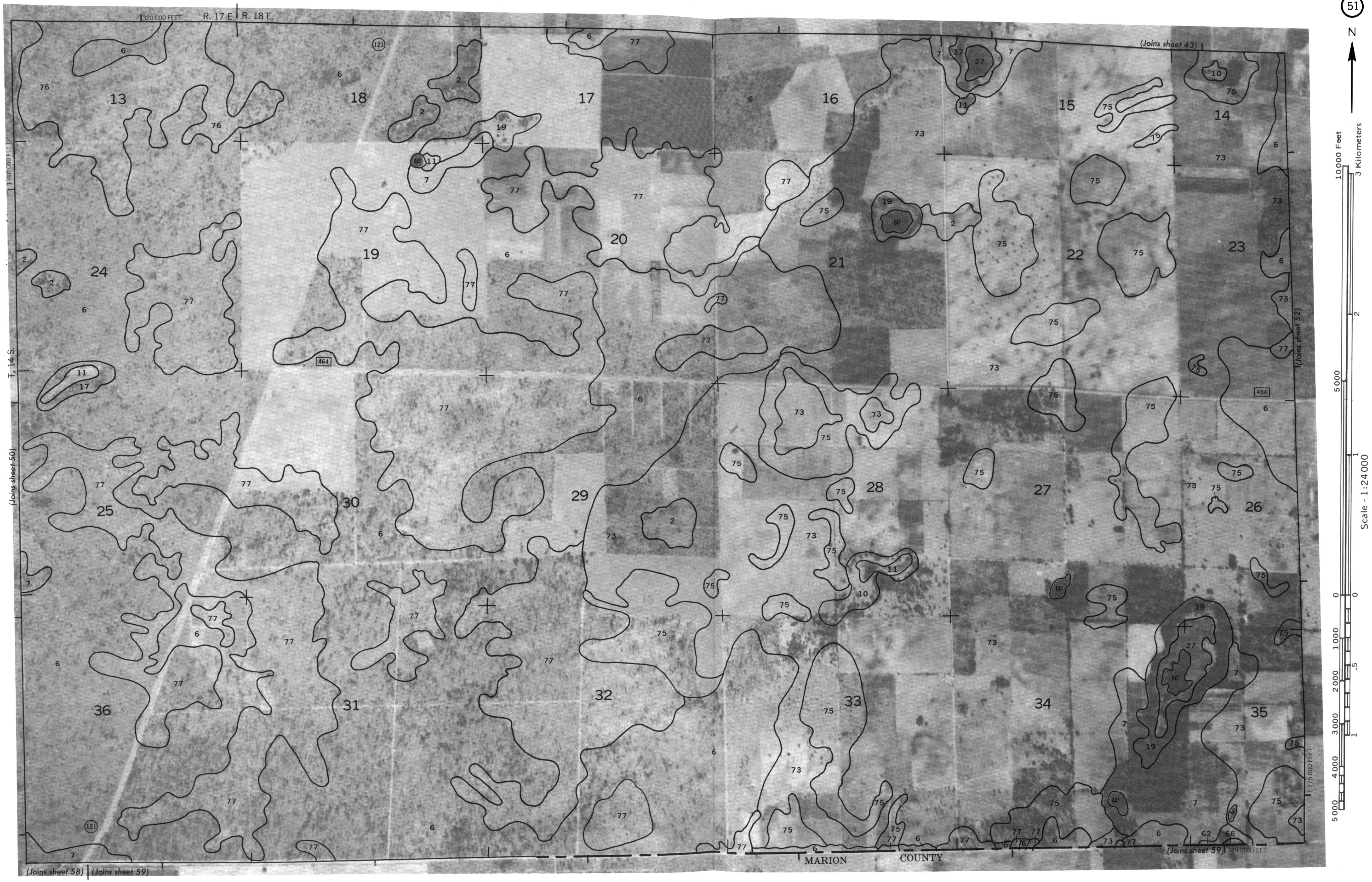

48
N
10 000 Feet
3 Kilometers
Scale - 1:24 000
R. 14 E. | R. 15 E.
(Joins sheet 40)
(Joins sheet 47)
(Joins sheet 49)
(Joins sheet 56)
255 000 FEET
1 760 000 FEET
230 000 FEET
1 775 000 FEET
T. 14 S.
Rocky Run
Camp D
Camp E
MAIN LINE ROAD
Otter Creek
Wacasassa River
345

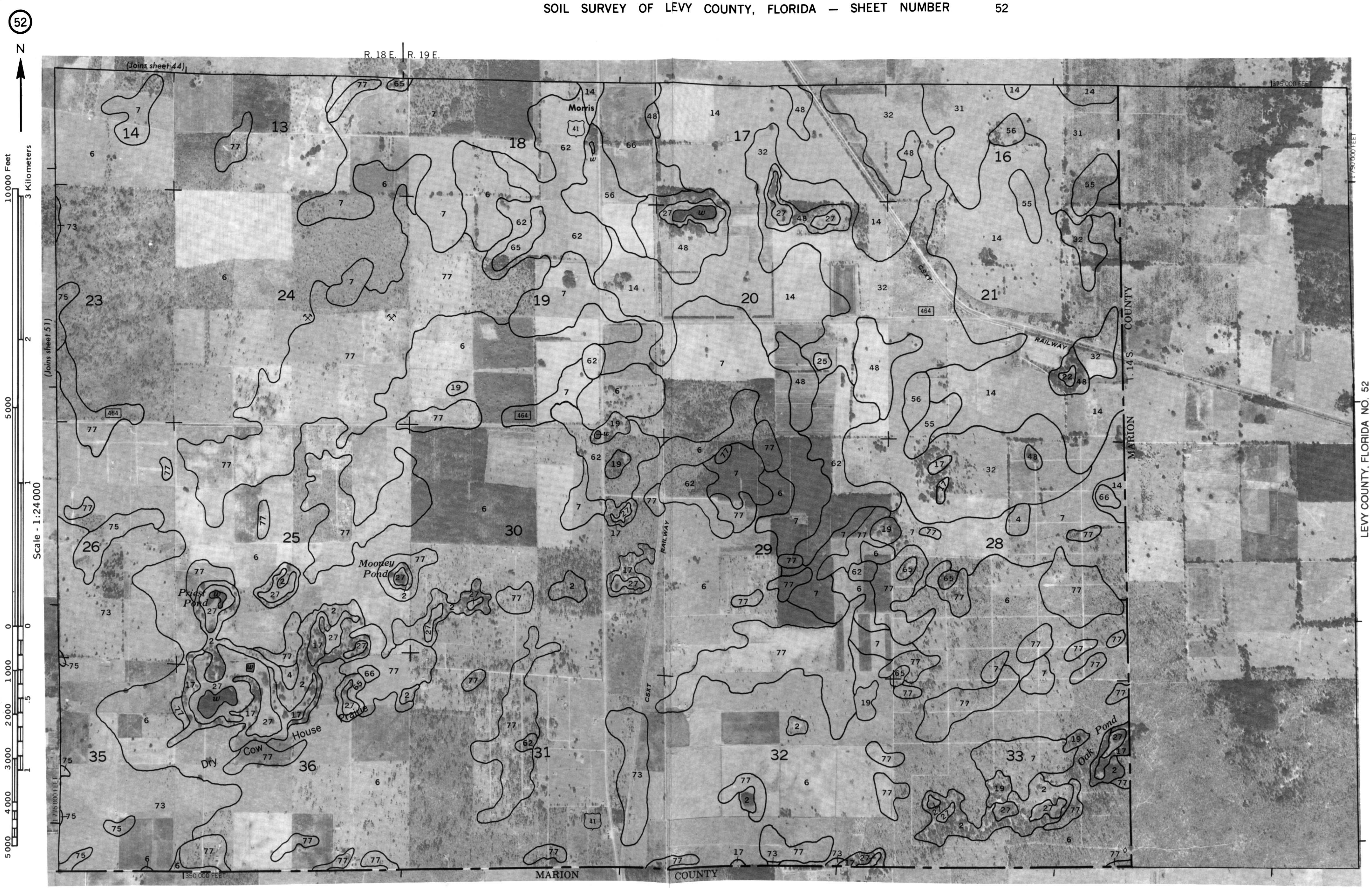

49
N
R. 15 E. R. 16 E.
260 000 FEET
(Joins sheet 40)
(Joins sheet 48)
790 000 FEET
T. 14 S.
(Joins sheet 41)
(Joins sheet 50)
(Joins sheet 57)
285 000 FEET
175 000 FEET
Wacasassa
River
Mule
Creek
Wekiva
Island
Pine
Road
Slough
Cow
Cabbage
Drain
Creek
Porter
326
343
19 98
311
10000 Feet
3 Kilometers
Scale - 1:24 000

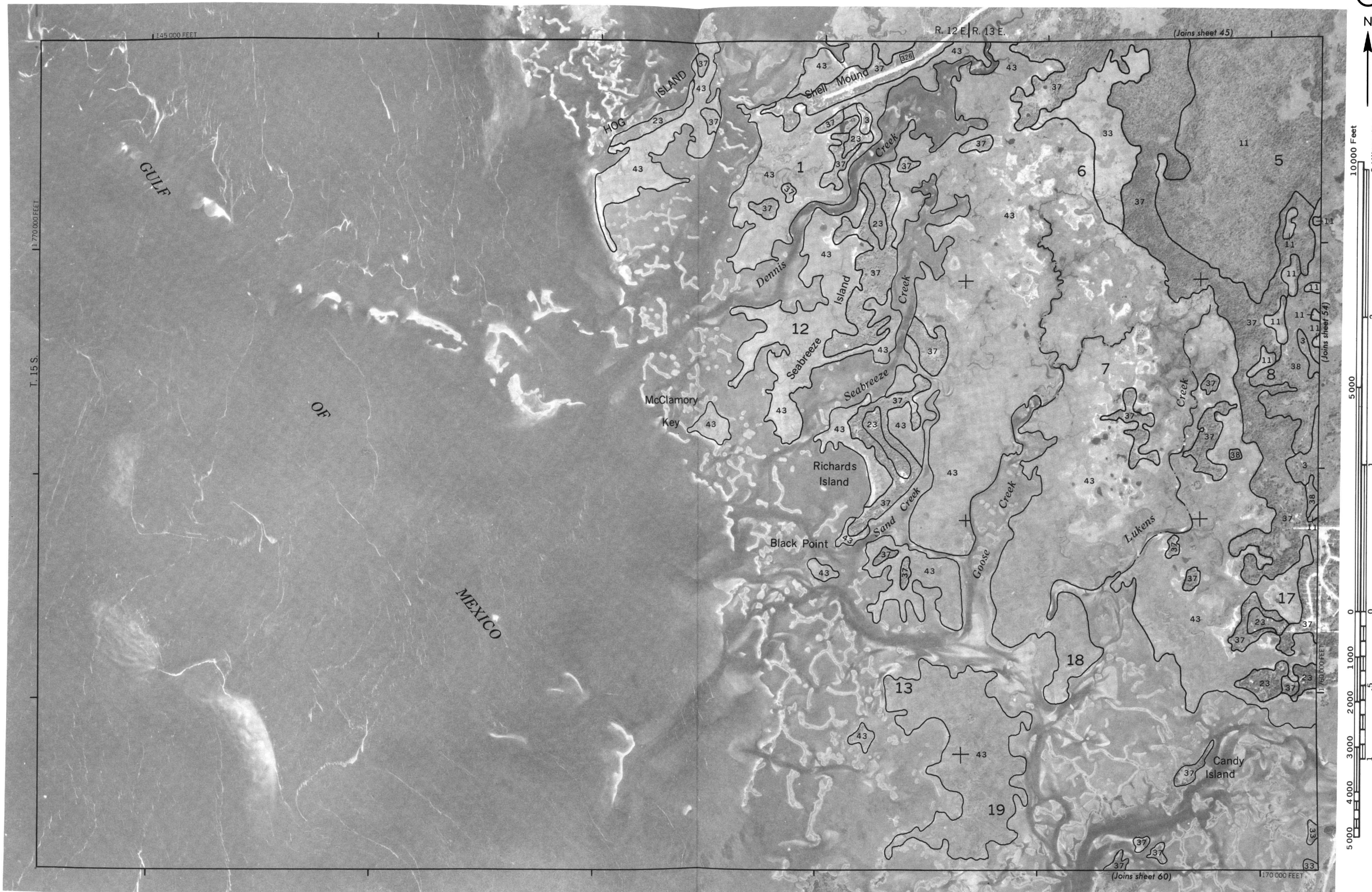
(50)



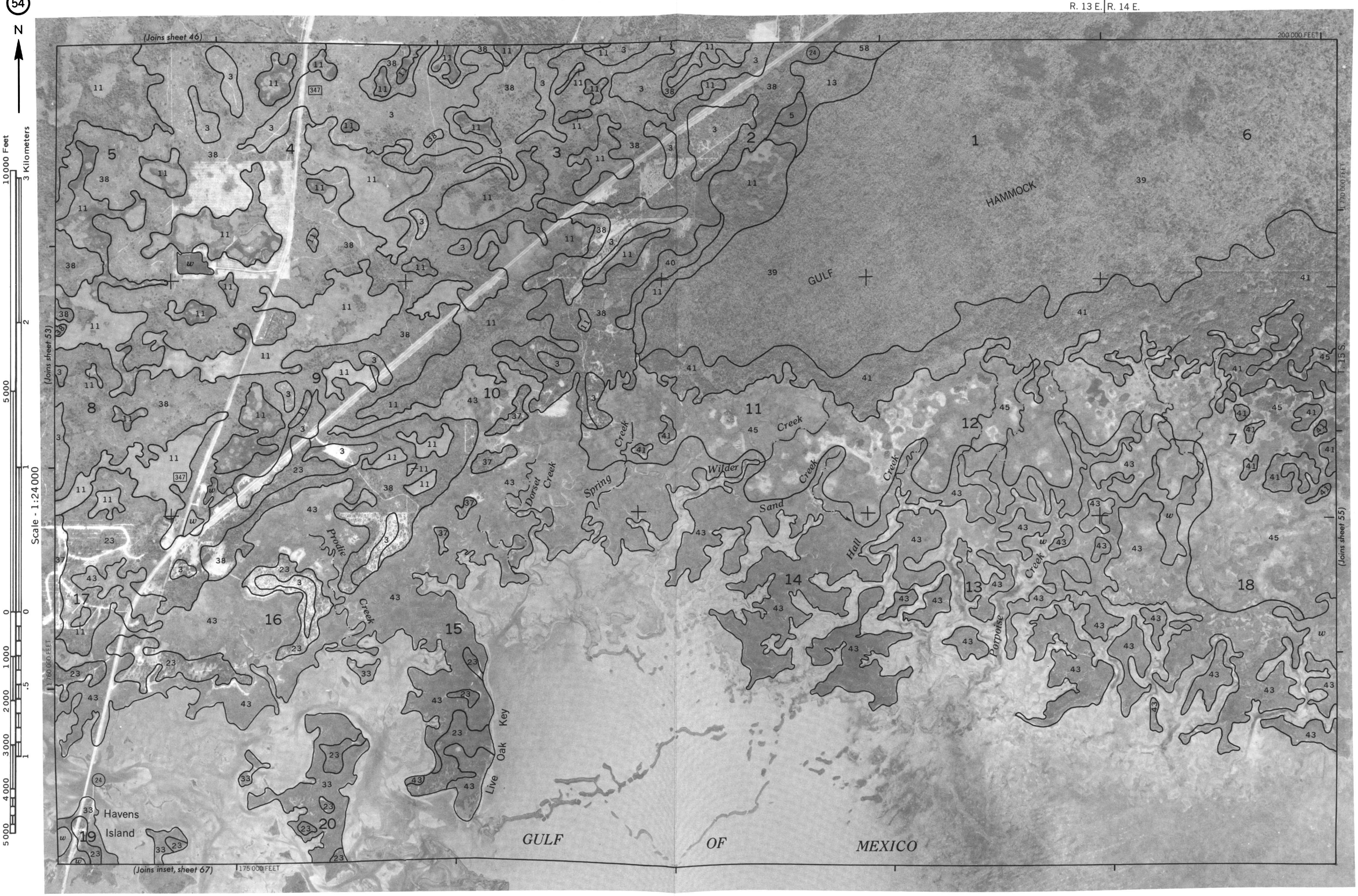
N
R. 16 E.
R. 17 E.
(Joins sheet 42)
315 000 FEET
1 790 000 FEET
T. 14 S.
(Joins sheet 49)
(Joins sheet 51)
Race Pond
Big
Wolf
Arbor
Cow
Creek
Cabbage
Drain
337
1 775 000 FEET
290 000 FEET
(Joins sheet 57)
(Joins sheet 58)
10000 Feet
3 Kilometers
Scale - 1:24 000

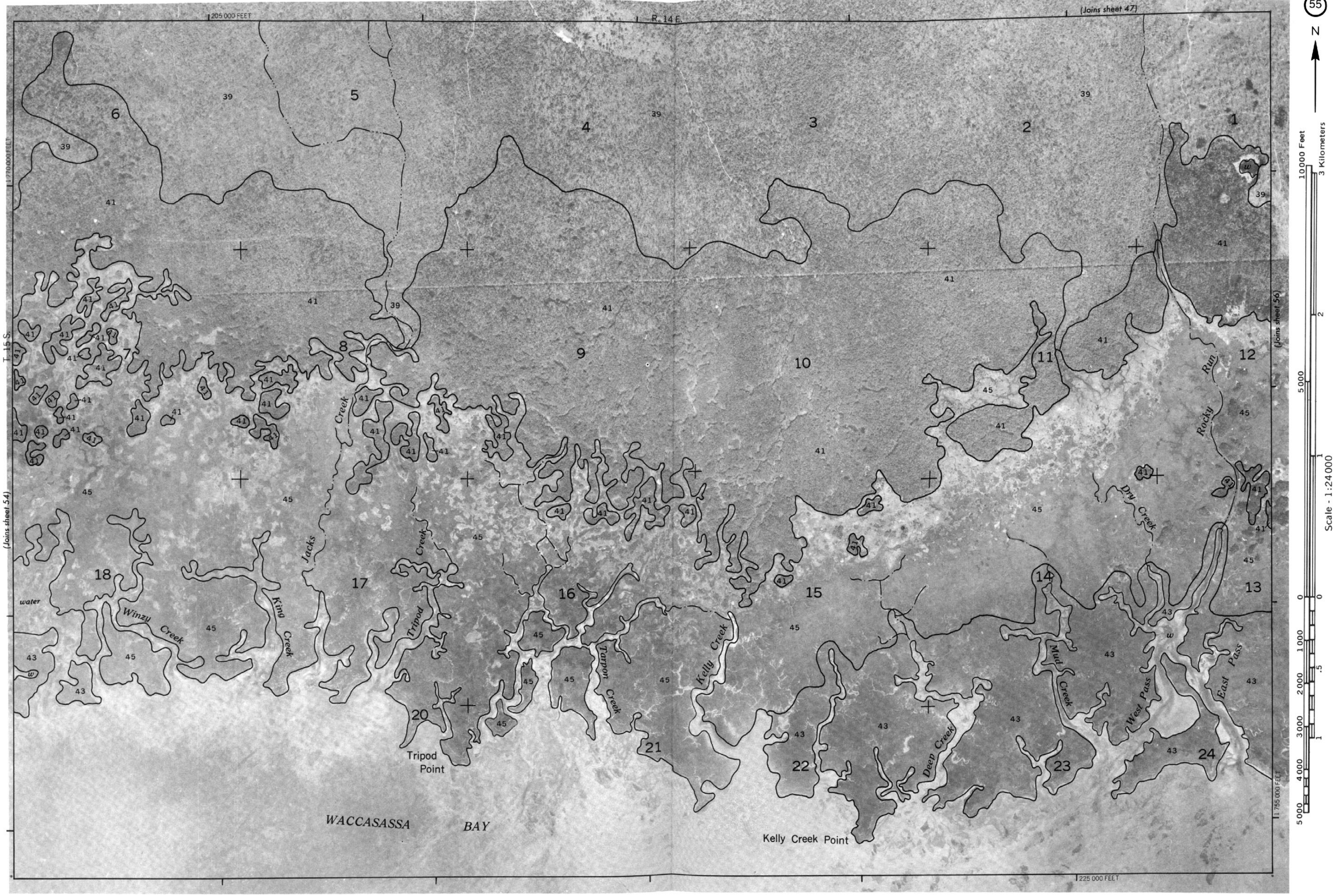

51
N
R. 17 E.
R. 18 E.
320 000 FEET
1 780 000 FEET
T. 14 S.
(Joins sheet 43)
(Joins sheet 52)
(Joins sheet 50)
(Joins sheet 58)
(Joins sheet 59)
(Joins sheet 59)
345 000 FEET
1 775 000 FEET
MARION
COUNTY
121
464
13
18
17
16
15
14
24
19
20
21
22
23
25
30
29
28
27
26
36
31
32
33
34
35
10 000 Feet
3 Kilometers
Scale - 1:24 000

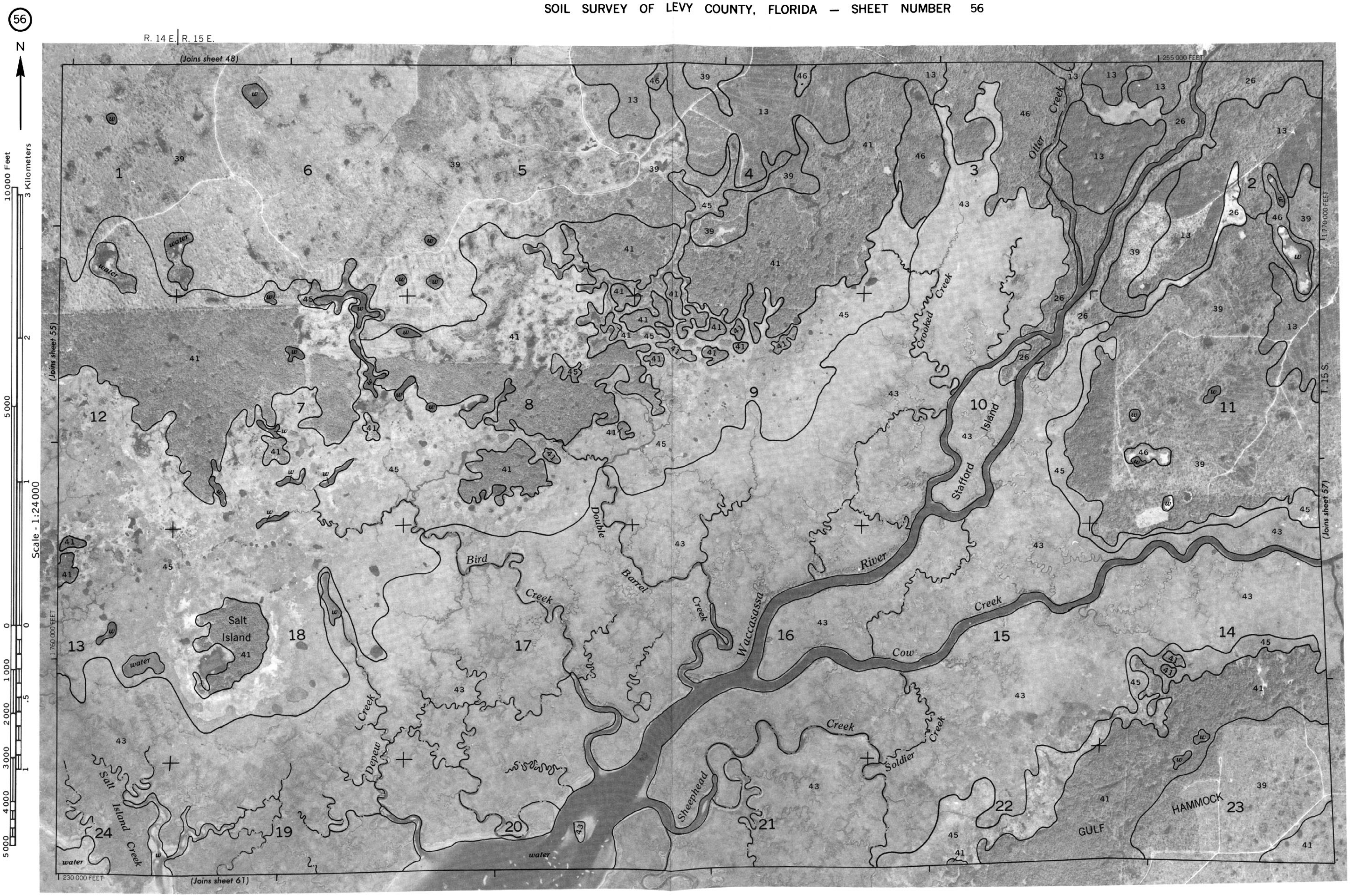

52
N
10000 Feet
3 Kilometers
Scale - 1:24 000
(Joins sheet 44)
(Joins sheet 51)
R. 18 E.
R. 19 E.
T. 14 S.
Morris
Mooney Pond
Priest Pond
Dry Cow House Prairie
Oak Pond
CSXT RAILWAY
MARION COUNTY
LEVY COUNTY, FLORIDA NO. 52

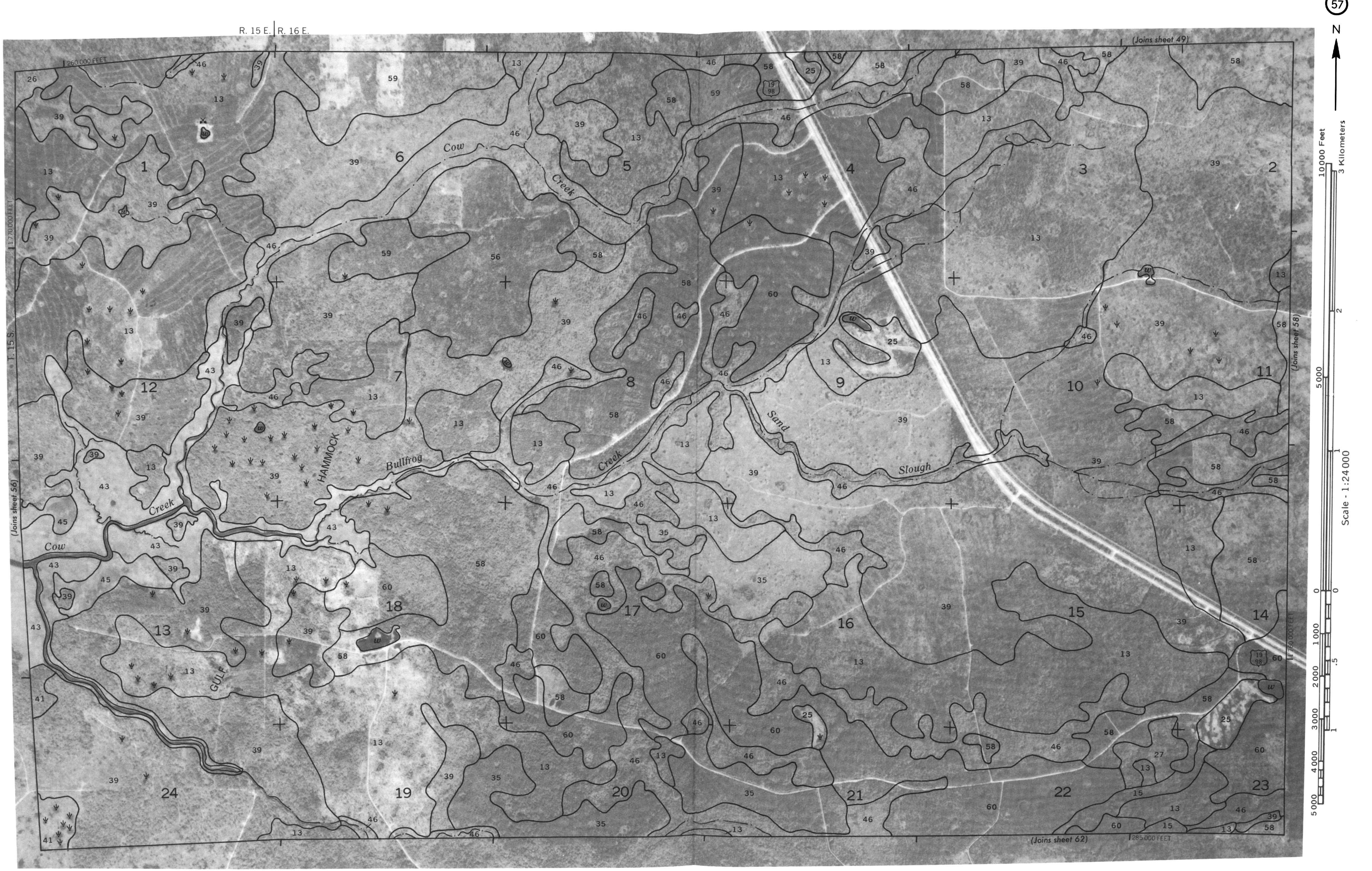

53
LEVY COUNTY, FLORIDA NO. 53
T. 15 S.
R. 12 E. | R. 13 E.
(Joins sheet 45)
(Joins sheet 54)
(Joins sheet 60)
145 000 FEET
170 000 FEET
1 770 000 FEET
1 760 000 FEET
GULF
OF
MEXICO
HOG ISLAND
Shell Mound
326
Dennis Creek
Island Creek
Seabreeze
Seabreeze
McClamory Key
Richards Island
Black Point
Sand Creek
Goose Creek
Lukens Creek
Candy Island
N
Scale - 1:24 000
10000 Feet
3 Kilometers
5000
2
1
0
1000
2000
3000
4000
5000
.5

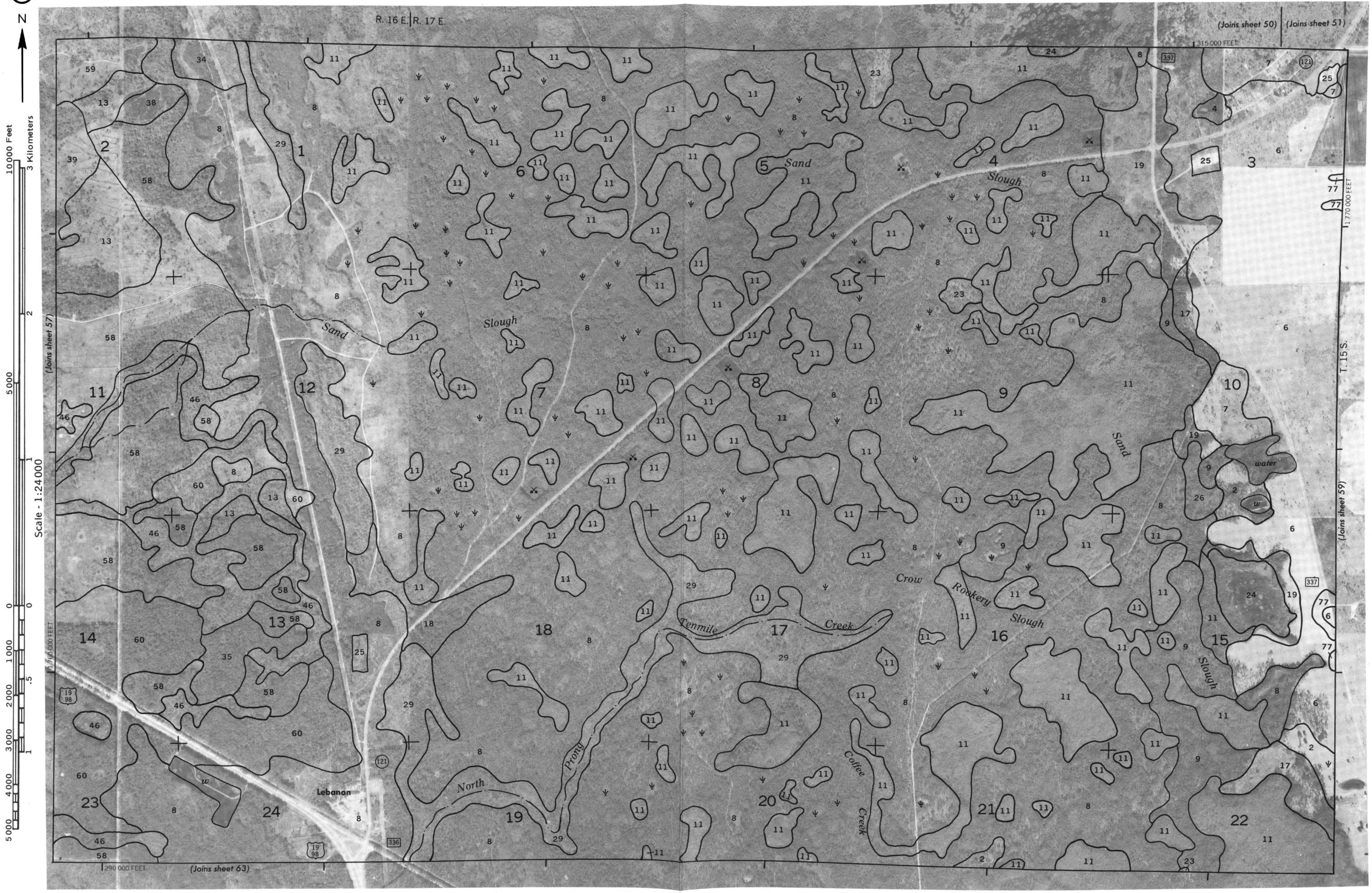
54

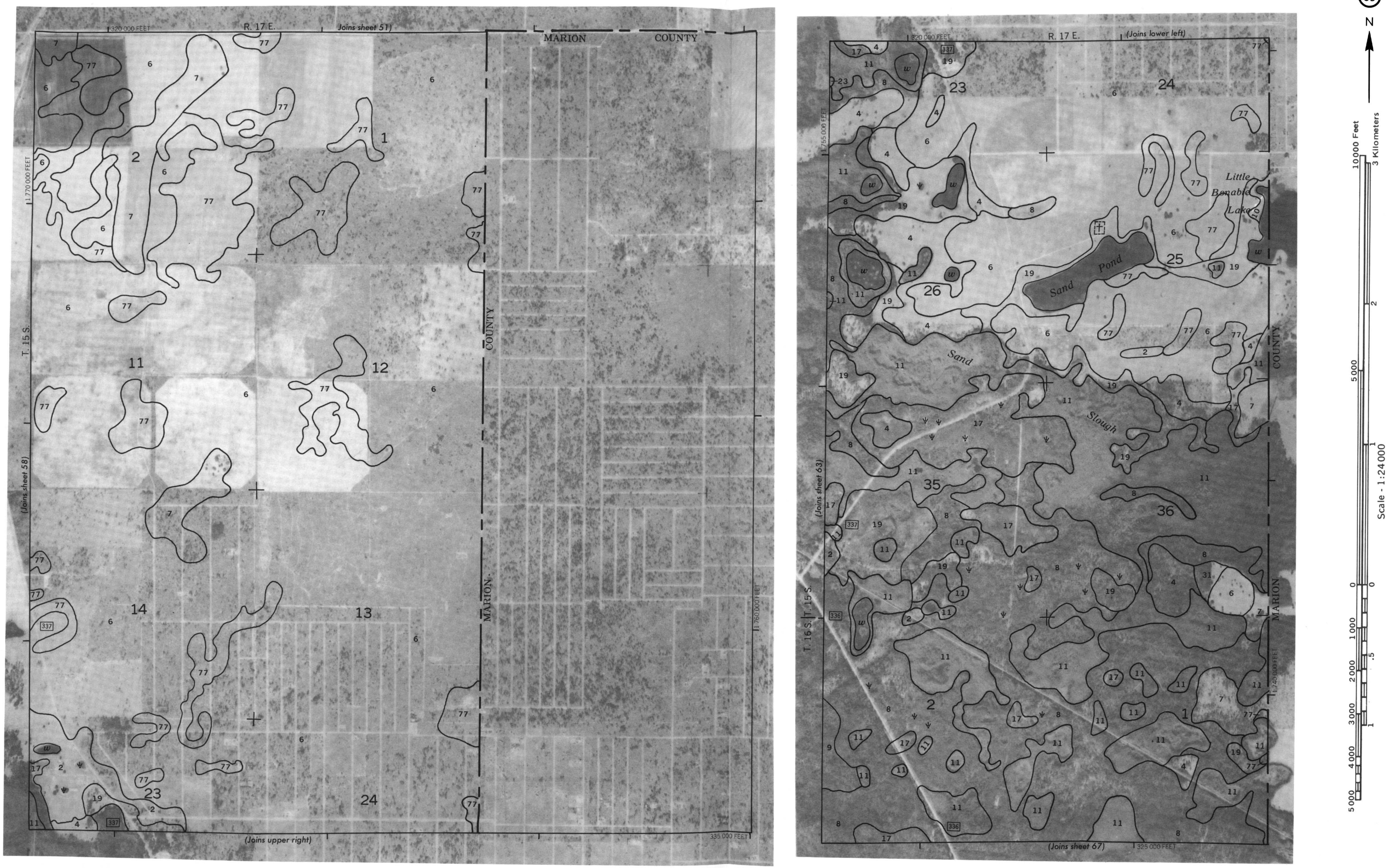

R. 13 E. | R. 14 E.
(Joins sheet 46)
(Joins sheet 53)
(Joins sheet 55)
(Joins inset, sheet 67)
HAMMOCK
GULF
Wilder Creek
Spring Creek
Dorset Creek
Prairie Creek
Sand Creek
Hall Creek
Porpoise Creek
Live Oak Key
Havens Island
GULF OF MEXICO
200 000 FEET
175 000 FEET
N
Scale - 1:24000
10000 Feet
3 Kilometers

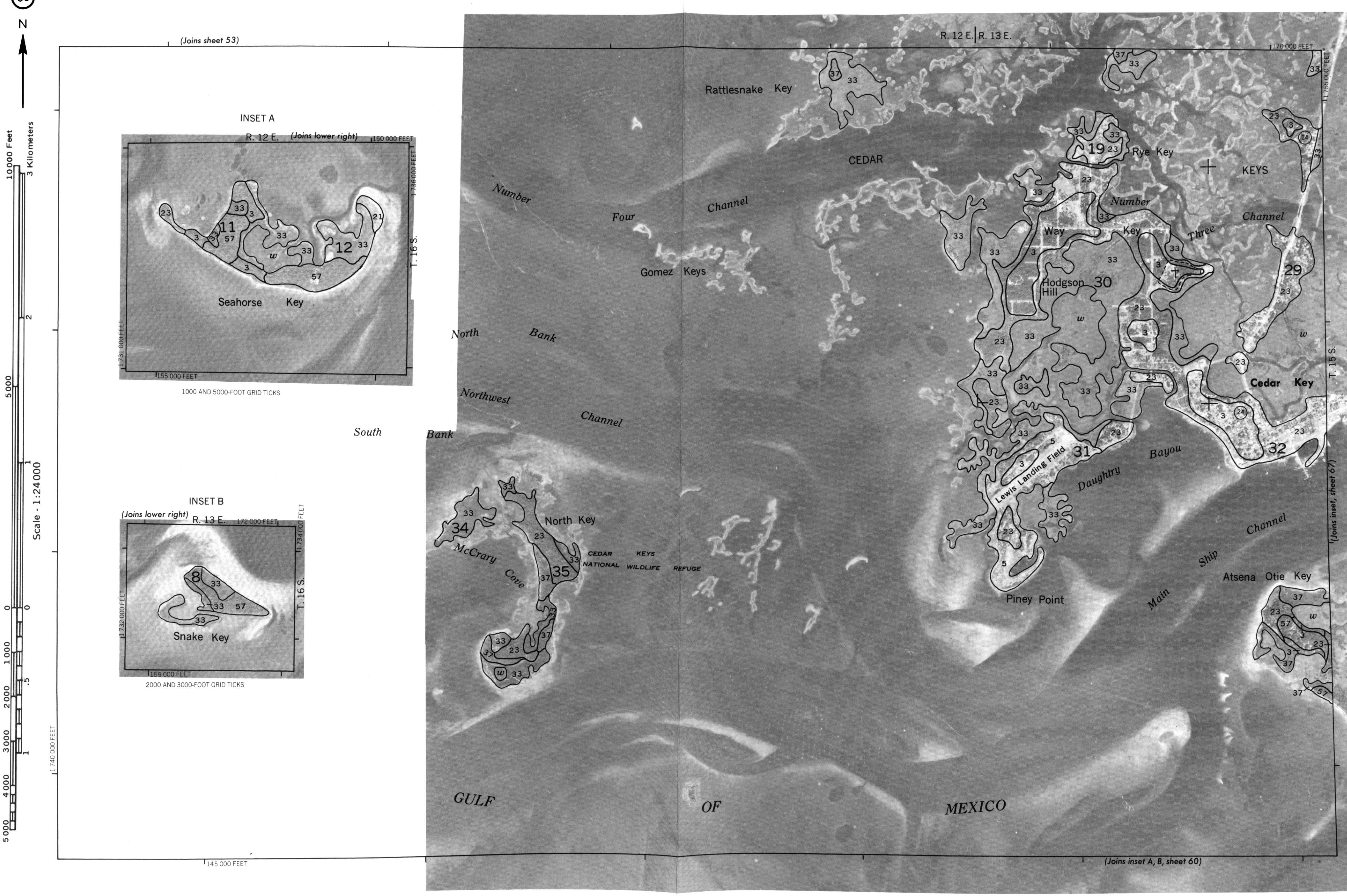

55
N
(Joins sheet 47)
205 000 FEET
R. 14 E.
LEVY COUNTY, FLORIDA NO. 55
T. 15 S.
(Joins sheet 54)
(Joins sheet 56)
1 770 000 FEET
1 755 000 FEET
225 000 FEET
Jacks Creek
Creek
Winzy Creek
King Creek
Tripod Creek
Tarpon Creek
Kelly Creek
Deep Creek
Mud Creek
West Pass
East Pass
Rocky Run
Dry Creek
Tripod Point
Kelly Creek Point
WACCASASSA BAY
water
Scale - 1:24 000
10 000 Feet
3 Kilometers


56
N
R. 14 E.
R. 15 E.
(Joins sheet 48)
(Joins sheet 55)
(Joins sheet 57)
(Joins sheet 61)
255 000 FEET
1 770 000 FEET
1 760 000 FEET
230 000 FEET
T. 15 S.
10 000 Feet
3 Kilometers
Scale - 1:24000
Otter Creek
Crooked Creek
Stafford Island
Double Barrel Creek
Bird Creek
Waccasassa River
Cow Creek
Soldier Creek
Sheephead Creek
Depew Creek
Salt Island
Salt Island Creek
GULF HAMMOCK
water

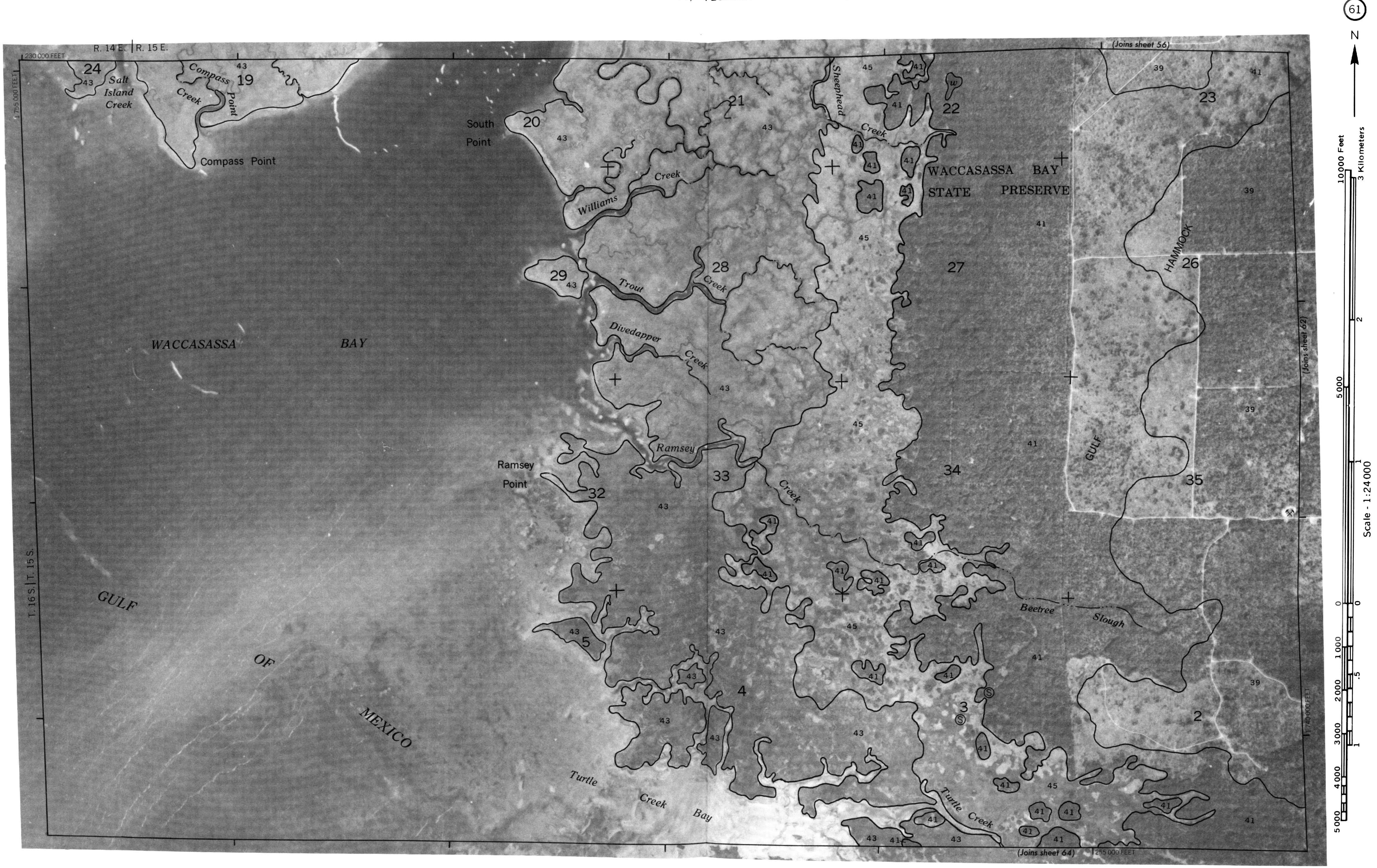

57
N
R. 15 E. | R. 16 E.
T. 15 S.
260 000 FEET
1 770 000 FEET
285 000 FEET
1 760 000 FEET
(Joins sheet 49)
(Joins sheet 56)
(Joins sheet 58)
(Joins sheet 62)
Cow Creek
Bullfrog Creek
Sand Slough
HAMMOCK
GULF
19 98
Scale - 1:24000
10 000 Feet
3 Kilometers

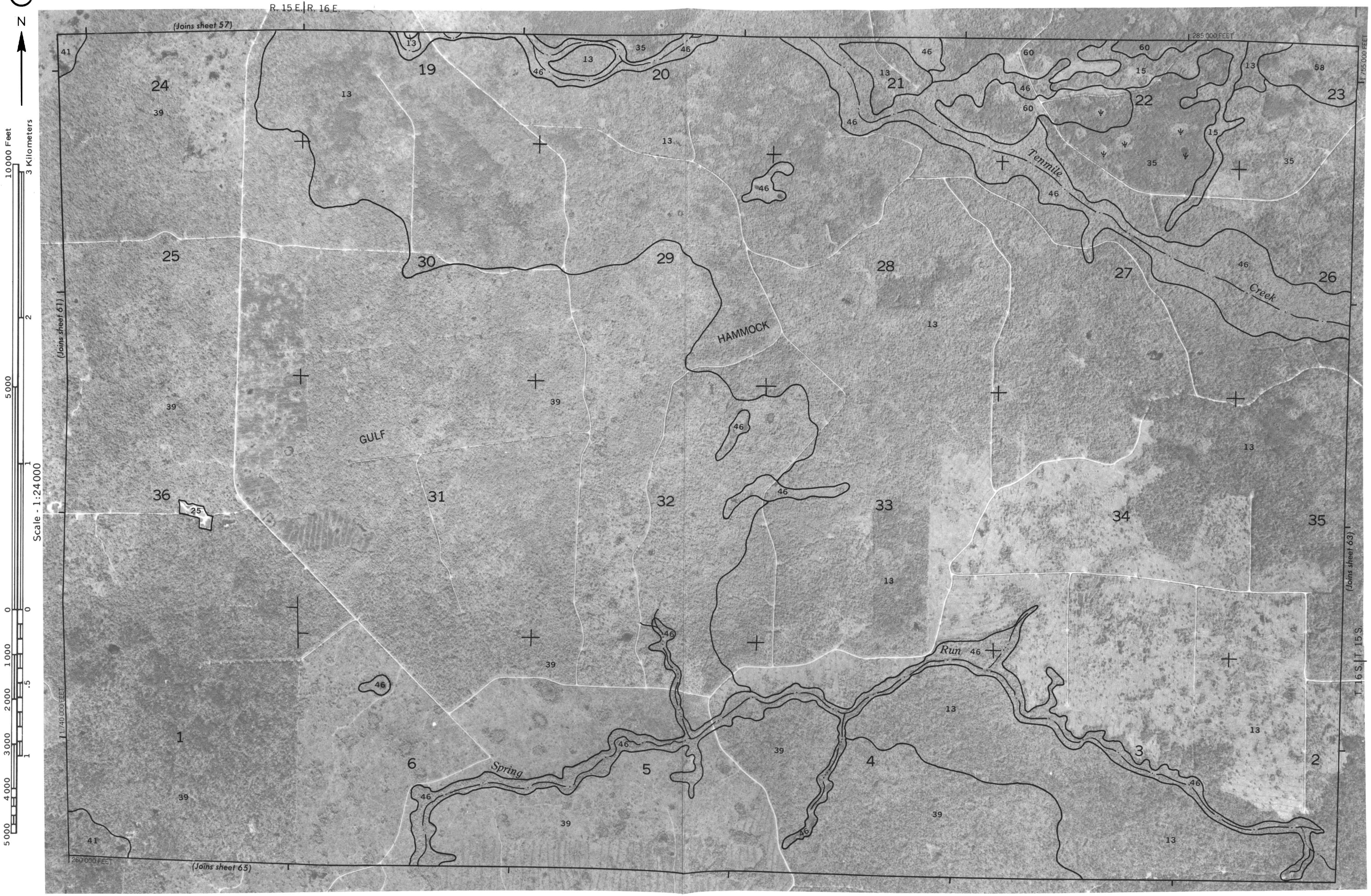

N
R. 16 E. | R. 17 E.
(Joins sheet 50)
(Joins sheet 51)
315 000 FEET
1 770 000 FEET
T. 15 S.
(Joins sheet 57)
(Joins sheet 59)
(Joins sheet 63)
290 000 FEET
1 760 000 FEET
Scale - 1:24 000
10000 Feet
3 Kilometers
Sand Slough
Crow Rookery Slough
Tenmile Creek
North Prong
Coffee Creek
Sand Slough
Lebanon
water
19 98
121
336
337


R. 17 E.
Joins sheet 51
MARION COUNTY
T. 15 S.
(Joins sheet 58)
(Joins upper right)
(Joins lower left)
(Joins sheet 63)
(Joins sheet 67)
Little Bonable Lake
Sand Pond
Sand Slough
T. 16 S.
59
N
10000 Feet
3 Kilometers
Scale - 1:24 000



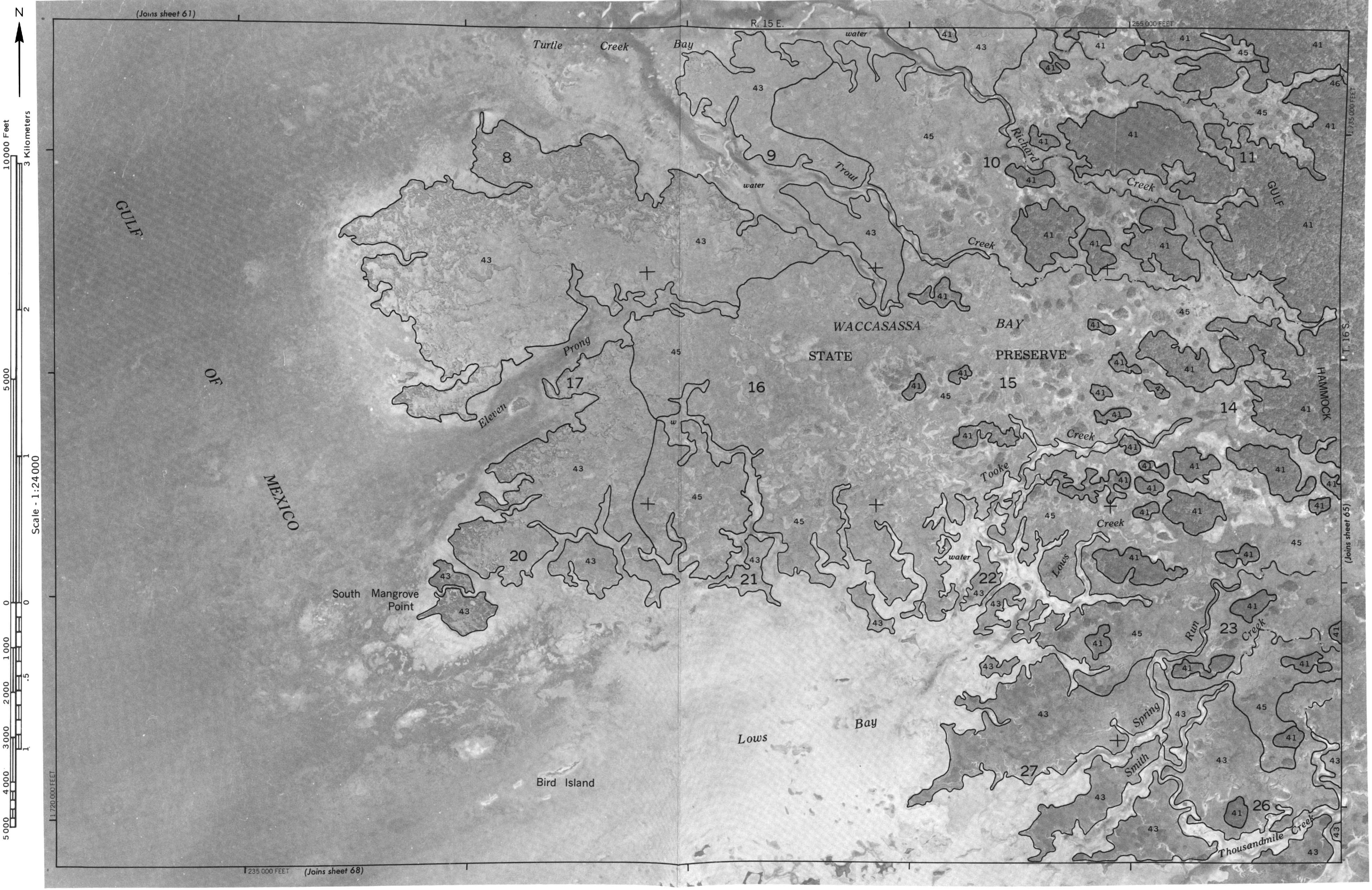
LEVY COUNTY, FLORIDA NO. 60


61
N
R. 14 E. | R. 15 E.
230 000 FEET
1 755 000 FEET
(Joins sheet 56)
(Joins sheet 62)
(Joins sheet 64)
255 000 FEET
1 740 000 FEET
T. 16 S. | T. 15 S.
Salt Island Creek
Compass Creek
Compass Point
South Point
Williams Creek
Trout Creek
Divedapper Creek
Ramsey Creek
Ramsey Point
Sheephead Creek
WACCASASSA BAY STATE PRESERVE
WACCASASSA BAY
GULF OF MEXICO
Turtle Creek Bay
Turtle Creek
Beetree Slough
GULF HAMMOCK
10 000 Feet
3 Kilometers
5000
Scale - 1:24 000



LEVY COUNTY, FLORIDA NO. 62

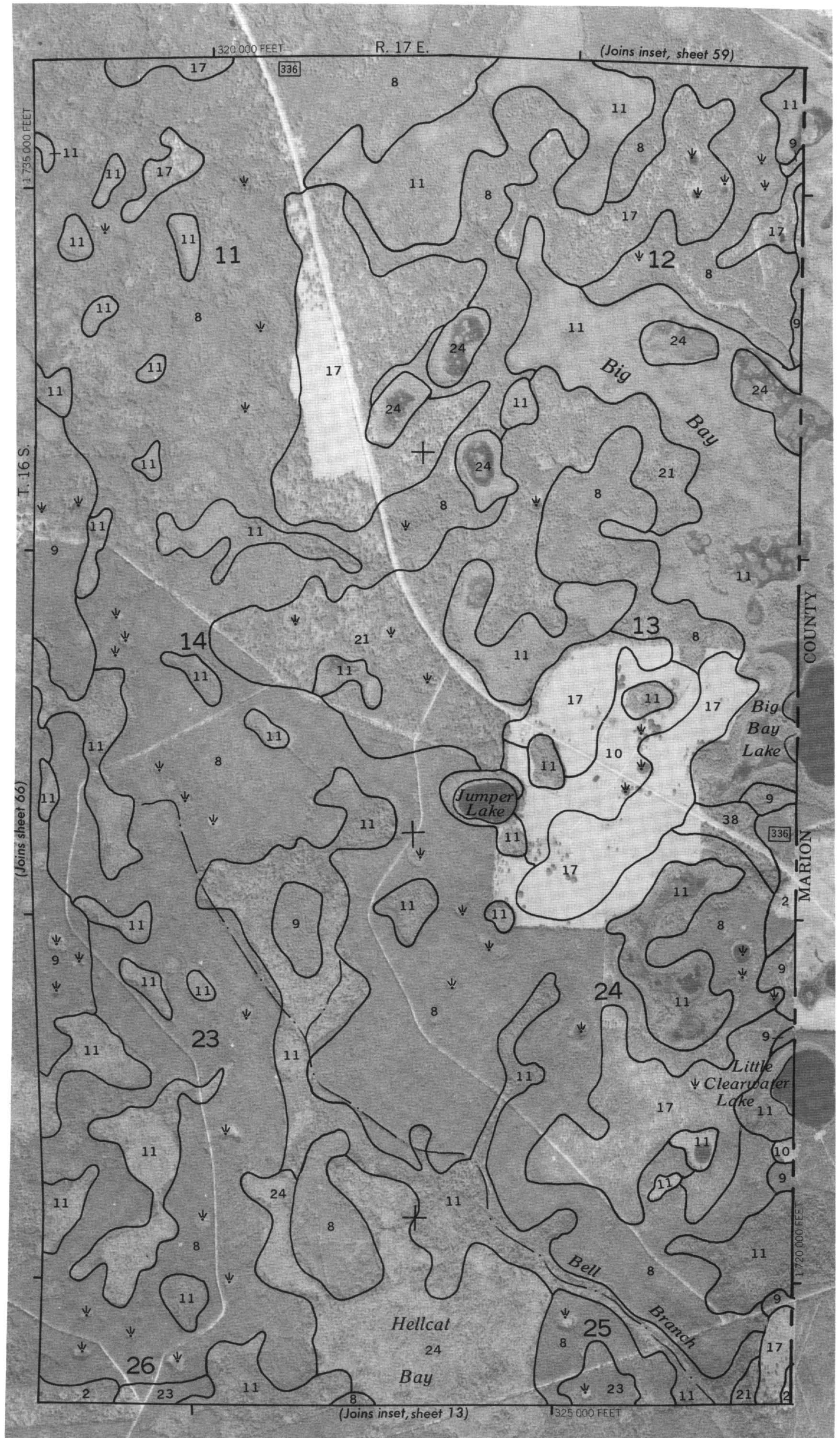

63
N
R. 16 E. | R. 17 E.
290 000 FEET
1 755 000 FEET
(Joins sheet 58)
(Joins sheet 62)
(Joins inset, sheet 59)
(Joins sheet 66)
315 000 FEET
1 740 000 FEET
T. 15 S.
T. 16 S.
North Prong
Tenmile Creek
Spring Run
Big Spring
LEVY COUNTY, FLORIDA NO. 63
Scale - 1:24 000
10 000 Feet
3 Kilometers

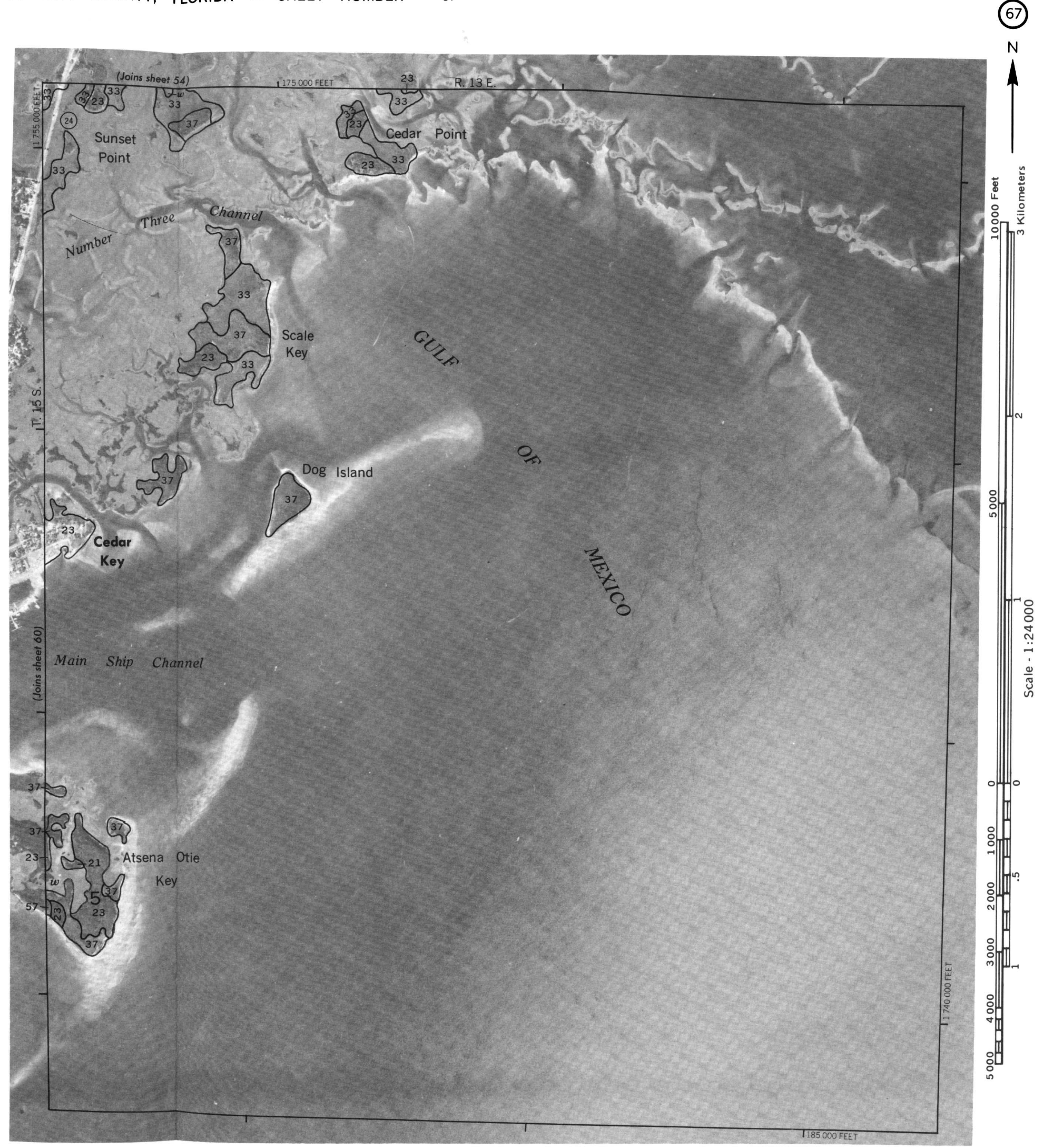

N
10 000 Feet
3 Kilometers
Scale - 1:24 000
(Joins sheet 61)
(Joins sheet 65)
(Joins sheet 68)
R. 15 E.
T. 16 S.
255 000 FEET
235 000 FEET
1 735 000 FEET
1 720 000 FEET
GULF OF MEXICO
Turtle Creek Bay
WACCASASSA BAY STATE PRESERVE
Eleven Prong
Trout
Richard Creek
Creek
GULF HAMMOCK
Tooke Creek
Lows Creek
Run Creek
Spring Run
Smith
Thousandmile Creek
Lows Bay
South Mangrove Point
Bird Island
water
w

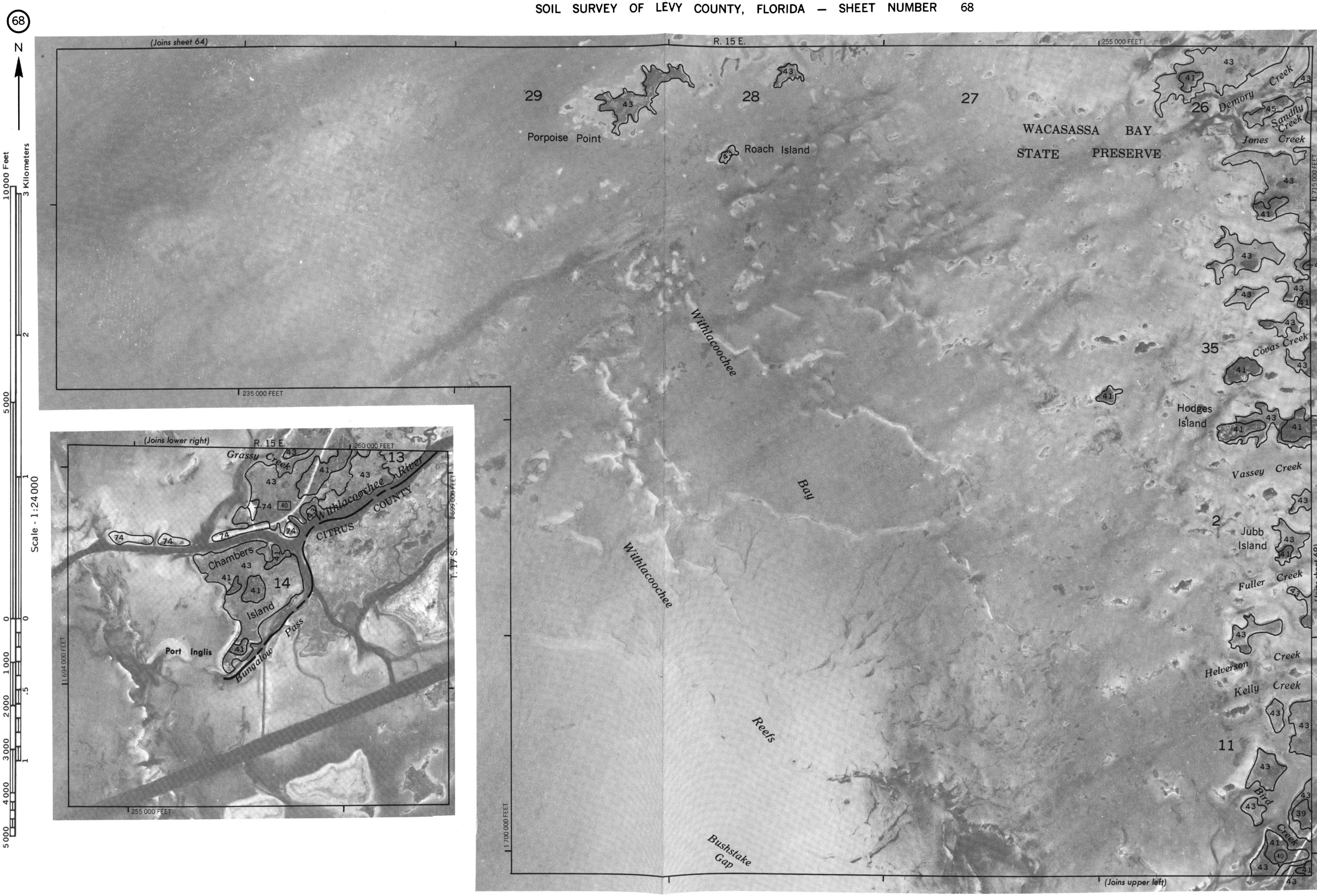

65
N
R. 15 E. | R. 16 E.
260 000 FEET
1 735 000 FEET
(Joins sheet 62)
(Joins sheet 66)
(Joins sheet 64)
(Joins sheet 69)
285 000 FEET
T. 16 S.
Turtle Creek
Spring Run
HAMMOCK
GULF
Spring Run
Smith Creek
WACASASSA BAY STATE PRESERVE
Thousandmile Creek
Demory Creek
water
Scale - 1:24 000
10 000 Feet
3 Kilometers

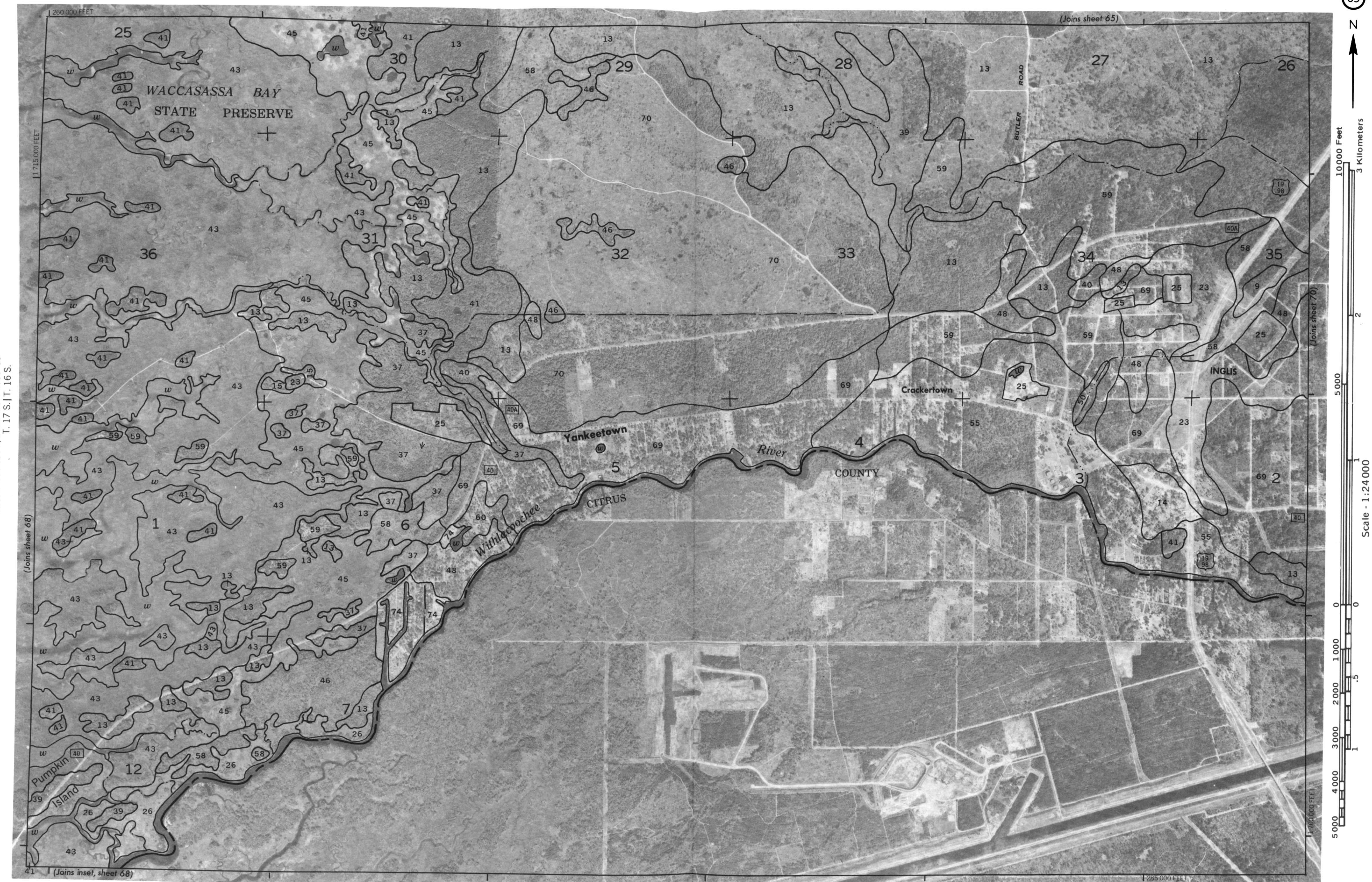
LEVY COUNTY, FLORIDA NO. 66

LEVY COUNTY, FLORIDA NO. 67






68
N
10000 Feet
3 Kilometers
Scale - 1:24000
(Joins sheet 64)
R. 15 E.
255 000 FEET
235 000 FEET
29
28
27
26
35
2
11
14
13
Porpoise Point
Roach Island
WACASASSA BAY
STATE PRESERVE
Demory Creek
Sandfly Creek
Jones Creek
Covas Creek
Hodges Island
Vassey Creek
Jubb Island
Fuller Creek
Helverson Creek
Kelly Creek
Bird Creek
Withlacoochee
Bay
Withlacoochee
Reefs
Bushstake Gap
(Joins upper left)
(Joins sheet 69)
T. 17 S. | T. 16 S.
LEVY COUNTY, FLORIDA NO. 68
1 700 000 FEET
715 000 FEET
(Joins lower right)
260 000 FEET
Grassy Creek
Withlacoochee River
CITRUS
COUNTY
Chambers Island
Port Inglis
Bungalow Pass
T. 17 S.
1 694 000 FEET
1 699 000 FEET
40
39
41
43
45
74


R. 15 E. | R. 16 E.
69
N
LEVY COUNTY, FLORIDA NO. 69
T. 17 S. | T. 16 S.
(Joins sheet 65)
(Joins sheet 68)
(Joins sheet 70)
(Joins inset, sheet 68)
260 000 FEET
1 715 000 FEET
285 000 FEET
WACCASASSA BAY
STATE PRESERVE
Yankeetown
Crackertown
INGLIS
Withlacoochee
River
CITRUS
COUNTY
Pumpkin
Island
BUTLER
ROAD
10000 Feet
3 Kilometers
Scale - 1:24000

T. 17 S. | T. 16 S.

LEVY COUNTY, FLORIDA NO. 70